National Marine Fisheries Service
Endangered Species Act (ESA) Section 7 Consultation
Biological Opinion and Conference Opinion
and Magnuson-Stevens Act Essential Fish Habitat Consultation

Action Agencies:	NOAA's National Marine Fisheries Service (NMFS)
Species/Evolutionarily Significant Units (ESUs) Affected:	Snake River Sockeye Salmon (*Oncorhynchus nerka*) Snake River Spring/Summer-run Chinook Salmon (*O. tshawytscha*) Snake River Fall-run Chinook Salmon (*O. tshawytscha*) Snake River Basin Steelhead (*O. mykiss*)
Essential Fish Habitat Affected:	Chinook salmon
Activities Considered:	Issuance of Section 10(a)(1)(B) Incidental Take Permit 1481 for Recreational Fisheries Conducted by Idaho Department of Fish and Game
Consultation Conducted by:	Salmon Recovery Division Consultation Number 2004/00967

This document constitutes NOAA's National Marine Fisheries Service's (NMFS) biological opinion for a proposed Federal action that is likely to affect the listed Snake River Spring/Summer Chinook Salmon ESU. The Federal action is NMFS' issuance of a 5-year ESA section 10(a)(1)(B) permit to the Idaho Department of Fish and Game (IDFG) for take of ESA-listed chinook salmon and steelhead during recreational fisheries in Idaho streams accessible to anadromous fish. NMFS concludes that this action is not likely to jeopardize the continued existence of the listed ESUs nor result in adverse modification or destruction of critical habitat currently designated or proposed for designation. NMFS further determines that EFH for Pacific salmon will not be adversely affected by the proposed fisheries.

This Opinion has been prepared in accordance with section 7 of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 *et seq.*) and in compliance with the Data Quality Act (§515 of PL 106-554). It is based on information provided in the permit application, published and unpublished scientific information on the biology and ecology of steelhead and spring chinook salmon in the action area listed under the ESA, and other sources representing the best available scientific information. A complete administrative record of this consultation is on file with the Salmon Recovery Division, Portland, Oregon.

Approved by: D. Robert Lohn

D. Robert Lohn, Regional Administrator

Date: 3/30/05

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1.0 CONSULTATION HISTORY

This biological opinion and conference opinion analyzes the effects of the NOAA's National Marine Fisheries Service's (NMFS) proposed issuance of permit 1481 for Idaho recreational fisheries. This opinion presents NMFS' review of the status of each Evolutionarily Significant Unit (ESU) considered in this consultation, the condition of designated critical habitat, the environmental baseline for the action area, all the effects of the action as proposed, and cumulative effects. For the jeopardy analysis, NMFS analyzes those combined factors to conclude whether the proposed action is likely to appreciably reduce the likelihood of the survival and recovery of the affected ESA-listed species. The critical habitat analysis determines the effects on critical habitat designated or proposed for designation for listed species by examining any change in the conservation value of the essential features of critical habitat.

The proposed permit, while new, would permit the ongoing recreational fishery activity previously addressed by permits 844, 1150, and 1233, with some additional refinements. The Idaho Department of Fish and Game (IDFG) submitted a request on February 25, 2004 (with amendments on March 4, 2004), to renew the ESA coverage for recreational fisheries provided by permit 1233, issued on May 26, 2000, under section 10 (a)(1)(B) of the Endangered Species Act (ESA) (IDFG 2004). In response to this application, NMFS is prepared to issue a new permit, designated Permit 1481 to cover three broad categories of Idaho recreational fisheries: (1) resident sport fisheries, managed under "General Fishing Regulations," (2) anadromous salmon fisheries managed under "Anadromous Salmon Fishing Regulations," and (3) summer steelhead sport fisheries managed under "Steelhead Fishing Regulations" (summarized below).

NMFS has issued three previous permits to Idaho for their recreational fisheries since listing naturally-produced Snake River sockeye salmon as endangered (November 20, 1991, 56 FR 58619), Snake River spring/summer and fall chinook as threatened (April 22, 1992, 57 FR 14653), and Snake River Basin steelhead as threatened (August 18, 1997, 62 FR 43937). In 1993, the IDFG applied for, and NMFS subsequently issued, permit 844 that same year after completion of a biological opinion (NMFS 1993). Permit 844 expired December 31, 1998, and Idaho applied for a new permit (#1150) which was issued on May 28, 1999, and expired at the end of 1999.

The IDFG's application for permit 1233 was accompanied by a conservation plan that details how fisheries are conducted. Permit 1233 was issued on May 26, 2000. The fisheries addressed under permit 1481 are the same activities that were initially addressed by permits 844, 1150, and 1233, and continue to be similar in time, location, and effect to the activities assessed in the earlier permits, with the primary differences being:

1. The sliding scale authorized in Modification 1 to Permit 1233 is modified to include the interim abundance target for summer-run chinook salmon with the existing interim abundance target of spring run chinook and applying the same percent mortality rates to the combined annual abundance.

2. Provisions for flexibility in the precise dates and locations of proposed selective salmon fisheries for adipose clipped fish are established, subject to the existing annual review process developed in Permit 1233.

Requested activities for incidental take authorization pursuant to the Department's fishing regulations are summarized below.

2.0 PROPOSED ACTION

This consultation complements the previous consultations and biological opinions that addressed issuance and modification of permit 1233 (NMFS 2000a). This opinion is an update of the previous analyses and addresses the effects of providing flexibility in setting the times and areas where spring chinook salmon recreational fishing may occur and applying a sliding scale method of assessment for the annual review of Idaho's recreational Snake River chinook salmon fishery. The new permit would expire on May 31, 2010, and provide coverage for approximately a five-year term. The provisions of the new permit relative to fisheries managed under General Fishing Regulations and Steelhead Fishing Regulations would be largely unchanged from permit 1233.

Impacts on listed steelhead from fisheries directed at resident fish species are addressed separately in a Fisheries Management and Evaluation Plan (FMEP) developed by the IDFG under limit 4 of this 4(d) rule (50 CFR 223.203(b)(4)) and currently pending determination by NMFS. Impacts on listed steelhead resulting from fisheries directed at non-listed hatchery-produced steelhead are addressed in the proposed permit 1481.

The action area for the proposed fishery actions is as follows (see Figure 1):

- Spring Chinook Salmon – The Snake River beginning at Lewiston, Idaho to Hells Canyon Dam, Clearwater River Basin, mainstem Salmon River, Little Salmon River, and South Fork Salmon River.
- Steelhead – The Snake River beginning at Lewiston, Idaho to Hells Canyon Dam, Clearwater River Basin, and Salmon River, including the Little Salmon River.
- General Fishing – Fishing for resident game fish species may take place in all of the rivers and streams accessible to anadromous fish, which includes the entire Salmon River drainage, the Snake River drainage downstream from Hells Canyon Dam, and the Clearwater River Drainage except the North Fork upstream from Dworshak Dam.

The following sections of this opinion summarize the fisheries (section 2.1), proposed management changes to chinook recreational fisheries added to the new permit (section 2.2), proposed inclusion of steelhead impacts (section 2.3), and proposed additions to the special conditions section for permit 1481 (section 2.4).

2.1 Recreational Fisheries

Permit 1481 authorizes annual incidental take of listed Snake River salmon resulting from recreational fisheries management by the IDFG. The permitted fisheries are classified by the IDFG, and referenced in this opinion, as follows:

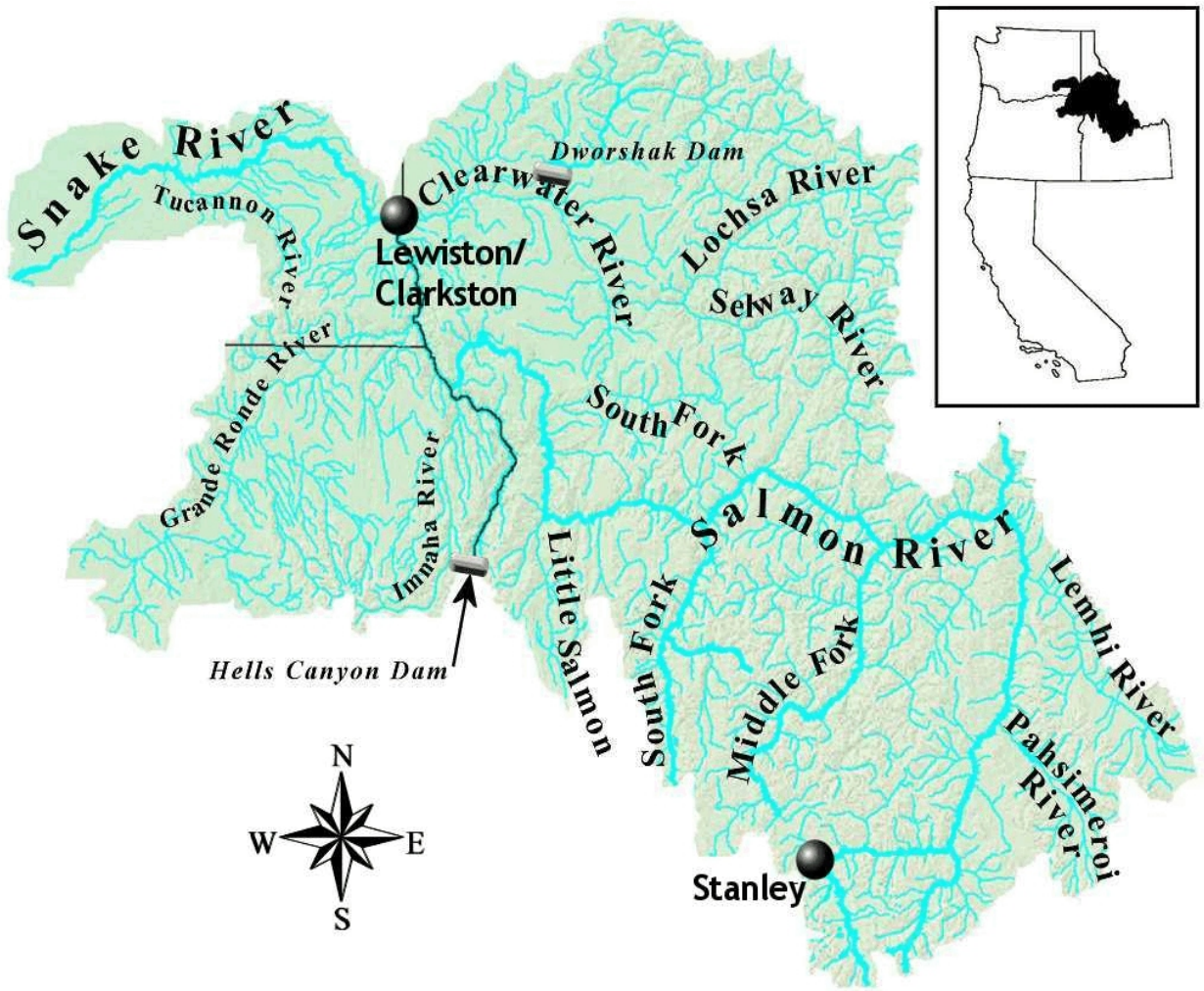

Figure 2. Map of the Snake River Basin, excluding areas upstream of Hells Canyon Dam.

General Fishing Regulations:

Mainstem Rivers and Tributaries. The general statewide stream-fishing season in Idaho runs from the Saturday of Memorial Day weekend through November 30. Exceptions to the general stream-fishing season include certain river sections that are open year-round and rivers or stream sections that are closed to fishing for all or part of the general stream-fishing season. General resident fishing targets resident species in the Salmon River sub-basin, the Clearwater River sub-basin, and the Snake River below Hells Canyon Dam. The incidental take of ESA-listed fish may occur when adult, jack, or juvenile Snake River spring/summer or fall chinook salmon, sockeye, or steelhead are mistaken for resident species and harvested unintentionally or as a result of hooking mortalities when listed species are caught and released by anglers.

Redfish, Alturas, and Pettit Lakes. Kokanee fishing is allowed in Redfish, Alturas, and Pettit Lakes. The purpose of the fishery is to reduce the kokanee population in the Stanley Basin lakes because kokanee are a direct competitor with captive brood sockeye salmon for habitat and food.

All ESA-listed, hatchery-produced sockeye are adipose-fin-clipped and must be released by anglers.

Anadromous Salmon Fishing Regulations:

Proposed fisheries for chinook salmon under the Anadromous Fishing Regulations would be subject to annual review by NMFS in the Northwest Region. The review will focus on: (1) the projected return of naturally produced listed adults, listed and non-listed hatchery-produced adult salmon to the respective watersheds; (2) the forecasted encounter rates of unlisted and listed fish; (3) the proposed season dates, locations, and other activities tailored to minimize the mortality of ESA-listed fish in the watershed; and (4) the annual incidental take caps described below. The Department will terminate fisheries when the state's harvest objective is achieved, the authorized mortality level of ESA-listed adult fish is reached, or when the specified termination date is reached for each recreational fishery, whichever occurs first. The proposed permit will describe maximum boundaries and dates for purposes of framing the scope of authorization assessment. Specific boundaries and dates tailored to meet specific fishery needs and conditions will be assessed during the annual review process and will be within the ranges provided in the permit.

Steelhead Fishing Regulations:

Waters open to harvest of steelhead include: (1) the Clearwater River from its mouth upstream to Clear Creek, the South Fork Clearwater River upstream to Red River, and the North Fork Clearwater River upstream to Dworshak Dam; (2) the Snake River from Lewiston, upstream to Hells Canyon Dam; (3) the Salmon River upstream to a posted boundary 100 yards downstream of the Sawtooth Hatchery weir; and (4) the Little Salmon River upstream to U.S. Highway 95 bridge near Smokey Boulder Road. Steelhead may be retained by recreational fishermen starting on September 1 on the Snake and Salmon Rivers, on the Clearwater River below Memorial Bridge on August 1, and on October 15 on the Clearwater River upstream of Memorial Bridge. The steelhead sport-fishery closes on April 30 for the Snake and Clearwater Rivers, on May 15 in the Little Salmon River, on March 31 in the Salmon River from its mouth upstream to Long Tom Creek, and on April 15 in the upper Salmon River. Only non-listed, hatchery-produced steelhead, with a clipped adipose fin as evidence by a healed scar may be harvested during open steelhead seasons. Steelhead without a clipped adipose fin as evidenced by a healed scar must be immediately released unharmed. An incidental take of listed, naturally produced steelhead and fall chinook salmon may occur due to hooking and release injuries. Few listed spring/summer chinook or sockeye are expected to be present during spring or fall steelhead fishing.

Regulations are adopted by the Idaho Fish and Game Commission, based on Idaho Department of Fish and Game staff recommendations and public input. General regulations for resident species recreational fishing and steelhead regulations are set biennially. Anadromous salmon fishing regulations are set annually, based on analysis of each year's run projections. Salmon regulations are often not finalized until actual counts of salmon migrating upriver confirm pre-season predictions of run size and composition. The regulations may be adjusted within one or two weeks of the season opening, and amended during the season on short notice.

2.2 Spring/Summer Chinook Fishery Management

NMFS is proposing to issue permit 1481 with conditions that require annual review and reauthorization with regard to salmon fisheries and to include provisions which allow the IDFG flexibility, within limits appropriate to the species' status, for the conduct of recreational chinook salmon fisheries. The annual review would address the IDFG Anadromous Salmon Sport Fishing regulations and would include recreational spring/summer chinook salmon fisheries in the Salmon River, Snake River, Little Salmon River, and Clearwater River basin (IDFG 2004). These fisheries, summarized below, would be directed at marked, hatchery-origin fish that are not part of the listed Snake River spring/summer chinook salmon ESU.

2.2.1 Annual Review and Reauthorization

Snake River spring/summer chinook salmon require additional protections to ensure survival and recovery when the ESU declines to very low numbers. There is a need to develop a process for administration of the fishery permit that can be responsive to highly variable population levels experienced in recent years for the Snake River spring/summer chinook salmon ESU while at the same time providing the necessary adaptive management flexibility for pre-season and in-season regulation adjustments to ensure that regulations are adequately protective. The proposed permit 1481 includes a process whereby NMFS annually reviews data and predictions of the number and composition of returning Snake River spring/summer chinook salmon runs, population status and trends of listed and unlisted salmon populations prior to authorizing the state-operated recreational fisheries in the Snake River basin. The proposed permit is intended to provide for responsive, scientifically founded fishery management that is sensitive to population abundance and trends and that will constrain the effects on listed salmon populations within conservative limits while allowing harvest of unlisted species.

NMFS is proposing to issue permit 1481 with annual review and approval provisions (see Section 2.4, Special Conditions below), that allow for annual flexibility to adjust salmon fishing regulations, including bag limits, open areas, and fishing dates according to annual variations in salmon abundance and river conditions. NMFS proposes to use a sliding scale cooperatively developed with IDFG for incidental harvest mortality to provide the necessary analytical tool for the annual analysis NMFS will conduct on IDFG's spring/summer chinook fishery proposal. The sliding scale is described in detail below. Annual approval of recreational fisheries would be based on this sliding scale, which provides for proportionately smaller incidental take in years of reduced natural fish returns.

In development of annual chinook fishery proposals, IDFG uses the TAC method of converting fish of Snake River origin at the mouth of the Columbia River upstream to Lower Granite Dam (IDFG 2002b). Based on past performance of the TAC estimate, the IDFG analyzes run sizes based on the TAC estimate +/- 50%. This approach produces a range of estimates for Snake River spring and summer chinook salmon returning to Lower Granite Dam. The proportion of the run that are hatchery-origin and natural-origin chinook is estimated based on smolt outmigrations in previous years and on jack counts in the preceding year. The projected number of naturally produced spring/summer chinook salmon adults returning to Lower Granite Dam

would be compared to the values in the sliding scale (Table 1) to estimate the potential allowable impact level from recreational fisheries. The impact rate could be translated into the allowable number of fish that can be caught and released. Estimates of the potential impacts in each of the river sections that are open to fishing would be calculated, and the impact limits would be used to design annual fishing regulations.

The proposed sliding scale is contained in the application, and summarized here. The sliding scale would be based on the number of adult spring/summer chinook projected to pass Lower Granite Dam as follows:

(1) no incidental take will be allowed, except for limited terminal areas, when fewer than 4,000 natural-origin spring/summer chinook cross Lower Granite Dam,
(2) the total incidental mortality of listed Snake River spring summer chinook salmon in recreational fisheries shall be no more than 0.25 % of the total run when between 4,000 and 6,400 natural-origin spring/summer chinook pass Lower Granite Dam,
(3) the incidental mortality shall not exceed 0.5% of the number of fish between 6,400 and 14,250;
(4) the incidental mortality shall not exceed 0.75% of the fish between 14,250 and 21,400;
(5) the incidental take shall not exceed 1.0% when the total run is between 21,400 and 28,500;
(6) the incidental take shall not exceed 1.5% between 28,500 and 35,600; and
(7) the incidental mortality shall not exceed 2.0% when the total run is in excess of 35,600.

Table 1. Proposed sliding scale for IDFG recreational fishing impacts on listed Snake River spring/summer chinook salmon in the Snake River basin (excluding the South Fork Salmon River terminal fishery).

Lower Granite Dam Predicted Return of Naturally Produced Listed Spring/Summer Chinook	Proposed Maximum Percent of Naturally produced Run Mortality for IDFG Recreational Fishery	Range of Potential Incidental Mortalities (number of fish)	Estimated Total Take (catch and release)
< 4,000 *	0%	0	-
4,001 to 6,400	0.25%	10 – 16	100 – 160
6,401 to 14,250	0.5%	32 – 71	320 – 710
14,251 to 21,400	0.75%	107 – 161	1,070 – 1,610
21,401 to 28,500	1.0%	214 – 285	2,140 – 2,850
28,501 to 35,600	1.5%	428 – 534	4,280 – 5,340
> 35,601	2.0%	> 712	>7,120

* At these low run sizes, fisheries should be restricted to terminal areas.

Application of the sliding scale could also affect which river sections may be open to fishing for chinook salmon in any particular year. In recent years, with the preseason prediction of large returns of hatchery-produced salmon and a preseason prediction of naturally-produced fish that has approached or exceeded the delisting level for the Snake River Spring/Summer Chinook Salmon ESU identified in the 1995 proposed recovery plan (NMFS 1995a), some additional river sections have been opened to fishing. Alternatively, in a year when preseason predictions of abundance return to the range observed prior to 2001, mixed stock fisheries such as the lower main stem of the Snake River or the Salmon River may not be appropriate. In the case of a predicted return of fewer than 10,000 naturally-produced fish, incidental impacts on listed fish would be limited to 50 or fewer and it is likely that the open fisheries would be restricted to areas where few listed fish are expected to occur, such as the Clearwater River, the Little Salmon River below Rapid River, and the Snake River reach immediately below Hells Canyon Dam. Also, in years of poor natural returns, because hatchery returns would also likely be poor, the recreational fishing season length and bag limit would likely be restricted compared to years with larger returns.

For purposes of impact assessment, all of the naturally produced spring chinook projected to return to Lower Granite Dam will be considered part of the listed ESU, although this group does contain unlisted but naturally produced fish bound for the Clearwater River basin.

2.2.2 Fishing Area – Clearwater River

Chinook fishing in the Clearwater River basin typically occurs from mid-April until either the annual harvest quota is reached or August 7, whichever comes first, and is targeted at unlisted surplus fish returning to the Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, and several remote satellite facilities operated in conjunction with Clearwater Fish Hatchery. The open fishing area includes the North Fork Clearwater River from its mouth upstream to Dworshak Dam at river mile 1.8, the Clearwater River from its mouth at Lewiston, Idaho, including the Middle Fork Clearwater River upstream to about river mile 100, South Fork Clearwater River, Clear Creek, and the Lochsa River. The open fishing area on the South Fork Clearwater extends upstream to its origin at the confluence of Red and American Rivers and the open area on the Lochsa River extends upstream to its origin at the confluence of Crooked Fork and Colt Killed Creek. Since chinook salmon from the Clearwater River are not listed under the ESA, no incidental take of ESA-listed spring/summer chinook salmon is expected. Current Department regulations only allow for the harvest of adipose fin-clipped hatchery fish. Future fisheries may allow for the harvest of unlisted fish with adipose fins. Harvest typically occurs between April 15 and August 7. The August 7 closure date helps minimize the take of ESA-listed fall chinook.

2.2.3 Fishing Area – Little Salmon River

The Little Salmon River chinook salmon fishery occurs from approximately mid-April until either the incidental take quota is reached, the State's harvest objective is attained, or August 7, whichever comes first, and is targeted at unlisted fish returning to the Rapid River Fish Hatchery and releases of Rapid River hatchery fish in the upper reaches of the Little Salmon River. Any ESA-listed adult fish that are taken incidentally in this fishery are fish that are bound for the Little Salmon River. The amount of suitable spawning habitat and the numbers of natural spawners in the Little Salmon River and its tributaries are limited and there is evidence of substantial hatchery influence in the natural spawning population. The open fishing area typically includes the Little Salmon River from its mouth upstream to Smokey Boulder Bridge, a distance of about 25 miles, but season dates and open areas may be adjusted depending on annual salmon run predictions.

The "early" opening date is intended to help facilitate harvest of the available hatchery adults and provide maximum opportunity for recreational anglers if the run is early. The August 7 closing date is chosen to include the first full weekend in August, yet close before listed Snake River fall chinook or steelhead are likely to be present in the fishing area. In-season monitoring will lead to closure of the fishing if take quotas or harvest shares are reached prior to the calendar date.

2.2.4 Fishing Area – Salmon River

The Salmon River chinook salmon fishery would occur from approximately mid-April until either the annual incidental take quota is reached, the State's harvest objective is attained or August 7, whichever comes first, and may harvest hatchery-produced fish returning to the Rapid River Fish Hatchery, McCall Fish Hatchery, Pahsimeroi Fish Hatchery, and/or Sawtooth Fish

Hatchery depending upon timing of the fishery, and the number of harvestable spring/summer chinook returning to these facilities in a year. ESA-listed fish are bound for the Little Salmon River and tributaries further upstream. The fishery would generally occur in the Salmon River from its mouth upstream to the mouth of the South Fork Salmon River. The fishing area may be further restricted in a given year to limit fishery impacts, or may be expanded to allow harvest of fish that are excess to conservation needs. The amount of natural spawning in this section of the Salmon River and its tributaries is limited; however, chinook salmon destined for spawning areas further upstream must pass through this river reach.

IDFG has also proposed chinook salmon fisheries in areas of the upper Salmon River to harvest hatchery-origin salmon that are returning to Sawtooth and Pahsimeroi Fish hatcheries in excess of conservation needs. If approved, the Sawtooth fishery would take place in approximately 6 miles of the main Salmon River immediately downstream from the Sawtooth Hatchery weir and in the main Salmon River for approximately 50 miles from the mouth of the Pahsimeroi River downstream to the mouth of the Lemhi River.

2.2.5 Fishing Areas – Snake River

Two sections of the main-stem of the Snake River may be open to fishing for spring chinook salmon.

Snake River, Imnaha River upstream to Hells Canyon Dam. The fishery typically takes place in the Snake River from a posted line at Dug Bar boat ramp, six miles upstream from the mouth of the Imnaha River, upstream to a posted line downstream from Hells Canyon Dam, a distance of about 60 miles. This reach of the Snake River forms the boundary between the states of Idaho and Oregon. The Snake River chinook fishery from the Imnaha River to Hells Canyon Dam occurs from approximately mid-April until either the annual incidental take quota is reached, the State's harvest objective is attained, or August 7, whichever comes first, and is targeted at surplus, unlisted, hatchery-produced fish of the Rapid River stock returning to the Hells Canyon Dam fish trap. Any ESA-listed adult fish that are incidentally caught and released in this fishery are believed to be strays from other drainages because there is very limited production of spring chinook in the Hells Canyon reach of the Snake River and the canyon tributaries.

Anglers from either Idaho or Oregon may fish these boundary waters, with Oregon fishers subject to Oregon Department of Fish and Wildlife (ODFW) adopting reciprocal regulations and reporting harvest and incidental take consistent with the conditions in this application. Joint fisheries in this reach of the Snake River will be reported by IDFG to ensure that harvest objectives are not exceeded. Access is limited in this river reach, so the anticipated effort and harvest in this fishery is limited compared to the other proposed spring, summer chinook fisheries.

Snake River, from Lewiston, Idaho, to Heller Bar. The proposed open area is from the Southway Bridge between Lewiston, Idaho, and Clarkston, Washington, upstream approximately 23 miles to the Heller Bar boat ramp (about 0.7 miles downstream of the mouth of the Grande Ronde River). This reach of the Snake River forms the boundary between the states of Idaho and

Washington. The chinook salmon fishery in this reach of the Snake River may occur from mid-April until August 7, or until either the annual incidental take quota is reached or the harvest objective is attained. The fishery may harvest unlisted hatchery-produced chinook salmon destined for the Clearwater River, Rapid River Hatchery, Hells Canyon Dam/Oxbow, McCall Fish Hatchery, Pahsimeroi Fish Hatchery, and Sawtooth Fish Hatchery. The fishery may also incidentally harvest listed adipose clipped hatchery-origin spring/summer chinook returning to the Pahsimeroi Hatchery, Sawtooth Hatchery, and Imnaha and Grande Ronde Rivers, depending upon timing of the fishery and the number of fish returning to these facilities each year.

Anglers from either Idaho or Washington may fish these boundary waters, subject to adoption of reciprocal fishing regulations by both states. Idaho anglers would fish in this area under terms of the proposed permit. Currently, incidental take for Washington anglers is covered under a Section 7 consultation for the mainstem Columbia River fisheries. The IDFG and the Washington Department of Fish and Wildlife (WDFW) will coordinate incidental take accounting and reporting for this fishery, should WDFW adopt reciprocal fishing regulations. WDFW may fish under this permit, contingent upon NMFS and IDFG concurrence, or may fish pursuant to some other form of ESA authorization, such as a separate Section 10 permit. The IDFG will report impacts and survey information related to joint fisheries in this reach of the Snake River, consistent with permit authorization.

2.2.6 Fishing Areas – South Fork Salmon River

The South Fork Salmon River fishery typically occurs from early June until either the annual incidental take quota is reached, the State's harvest objective is attained, or August 7, whichever comes first. The fishery harvests unlisted, hatchery-produced summer chinook returning to the South Fork Fish Trap. The fishery's current maximum boundary is between the mouth of the East Fork of the South Fork and the South Fork Trap because this is currently the fishing area for which incidental take standards are defined. However, if take standards are developed for other tributaries in the drainage, the downstream boundary may be moved further downstream to account for incidental take of other populations in the drainage. Incidental take terms and conditions of this fishery are subject to annual review and approval by NMFS under the standards established by NMFS in its 2001 Biological Opinion on Impacts of Treaty Indian and Non-Indian Fisheries in the Snake River Basin in Year 2001, on Salmon and Steelhead Listed Under the Endangered Species Act (NMFS 2001).

2.3 Take Authorization for Steelhead

Proposed permit 1481 will also authorize incidental take of juvenile and adult threatened Snake River Basin steelhead in spring/summer chinook fisheries managed by the IDFG under Anadromous Salmon Regulations and in fisheries targeting resident fish species managed by the IDFG under General Fishing Regulations (Figure 1). The steelhead take authorization addressed in this opinion does not constitute a change in the amount or type of take that has occurred in past years. The biological opinion on the original issuance of permit 1233 evaluated the impacts of resident species fishing and anadromous salmon fishing on steelhead. Take authorization for

adult steelhead is covered in this action while take authorization for juvenile steelhead affected by resident species fisheries is covered in an FMEP developed under section 4(d) of the ESA.

2.4 Special Conditions

NMFS proposes to issue a permit, designated permit 1481, to IDFG with the following Special Conditions designed to protect and conserve listed species that might be affected by the Idaho recreational fisheries program.

1. Spring/summer chinook salmon fishing must not continue after August 7 of any year to ensure that a take of threatened Snake River fall chinook salmon is not likely to occur.

2. Spring/summer chinook salmon fishing in the Snake River (Southway Bridge between Lewiston, Idaho, and Clarkston, Washington, to Heller Bar boat ramp approximately 0.7 miles downstream of the Grande Ronde River) must not continue past the end of June of any year in which fisheries occur in this area, to protect later running wild spring/summer chinook salmon.

3. The Snake River, Salmon River, Rapid River/Little Salmon River, Clearwater River, and South Fork Salmon River spring/summer chinook salmon fisheries are subject to annual approval by the NMFS. NMFS approval will be in the form of a letter from the Hatchery and Inland Fisheries Branch after NMFS receives a description from IDFG of the projected return numbers and harvest management intentions, and finds that year's proposed management consistent with this permit. In a year when the respective fishery is approved, the fishery must be terminated when the annual quota is achieved, the authorized annual mortality level of ESA-listed adult fish is reached, or annual specified termination date, whichever occurs first.

4. The IDFG must manage recreational fisheries to limit the incidental harvest of ESA-listed spring/summer chinook salmon, fall chinook salmon, steelhead and sockeye salmon to the levels described in the permit application. The IDFG must make use of its in-season monitoring information to watch for opportunities to shape the fishery in the Snake River, Salmon River, Clearwater River, South Fork Salmon River, and Little Salmon River to reduce proportional impacts on ESA-listed natural-origin chinook salmon.

5. The IDFG must maintain law enforcement and public information programs to enhance the protection of ESA-listed fish and to ensure compliance with ESA-listed fish protective regulations. The IDFG must:

    (a) Continue to provide public education and information materials that emphasize the importance of protecting ESA-listed anadromous fish species; (b) participate with co-managers and land management agencies to provide warning signs that will direct citizens to avoid disturbing salmon that are

spawning and to avoid wading or boating activities that may damage redds – the signs should also explain the legal and biological consequences of harassing or harming ESA-listed fish;
(c) provide law enforcement patrols focused on times and areas where ESA-listed anadromous fish may be vulnerable to illegal harvest or harassment; and
(d) restrict fishing activities and/or increase enforcement emphasis at any time or place that is identified during fisheries monitoring as exhibiting a potential hazard to ESA-listed fish.

6. The IDFG must take measures to prevent incidental take of ESA-listed fish by informing fishers on subjects such as differentiating ESA-listed from non-listed fish, avoiding redds, and methods for releasing non-target fish alive. Actions shall also be taken to identify and protect, through warning signs or other means, ESA-listed fish critical spawning areas. A summary of public education efforts must be provided in annual reports.

7. The IDFG must take measures to reduce deliberate illegal takes of ESA-listed fish. The IDFG's field biologists and conservation officers, through the IDFG, shall report illegal takes of ESA-listed adult and juvenile salmon to NMFS.

8. The IDFG must monitor recreational fisheries for the incidental catch of ESA-listed steelhead and sockeye and chinook salmon. The IDFG must continue to conduct creel surveys. Included in the surveys shall be the numbers of hatchery-marked and unmarked fish caught by anglers. Appropriate techniques shall be employed to determine whether unmarked fish were of hatchery or natural origin. Sampling all recreational fisheries that may result in incidental takes of ESA-listed fish for catch composition, including the collection of biological information, must also continue at levels comparable to those in recent years and must be increased where necessary to insure a thorough post-season analysis of fishery impacts on ESA-listed species. IDFG personnel shall conduct creel surveys or other forms of angler contact to monitor the possible incidence of illegal harvest activity. Results of monitoring efforts and creel surveys must be reported to NMFS on an annual basis.

9. The IDFG must conduct the following monitoring activities associated with the kokanee fishery in Redfish Lake, as stated in the IDFG's conservation plan:
(a) interview anglers at lake access points weekly;
(b) collect fishery information from local businessmen and campground hosts,
(c) conduct spot checks (with enforcement personnel) on the water and at lake access points;
(d) collect adipose fins from up to 100 creeled kokanee throughout the fishing season for mitochondrial DNA analysis; and
(e) post signs and release bulletins to the local media to alert anglers to the presence of adipose fin-clipped hatchery sockeye salmon in Redfish Lake.

10. IDFG must provide NMFS with an analysis of their proposed spring/summer chinook salmon fishery by March 15 of each year.

3.0 STATUS OF THE SPECIES UNDER THE ENVIRONMENTAL BASELINE

3.1 Status of Species

NMFS has determined that the actions being considered in this biological opinion may affect the following species under NMFS' jurisdiction that are protected under the ESA: Snake River sockeye salmon (*Oncorhynchus nerka*), Snake River spring/summer chinook salmon and fall chinook salmon (*O. tshawytscha*), and Snake River steelhead (*O. mykiss*). The following sections provide a brief summary of the current status of each affected ESU. More complete descriptions may be found in the biological opinions on issuance of permit 1233 (NMFS 2000a) and on the Federal Columbia River Power System (NMFS 2000b).

3.1.1 Snake River sockeye salmon

The Snake River sockeye salmon ESU, listed as endangered on November 20, 1991 (56 FR 58619), includes populations of sockeye salmon from the Snake River basin, Idaho. The extant populations occur only in three lakes located in Stanley Basin in the upper Salmon River drainage and in a captive brood stock program operated by the NMFS and the IDFG. Under NMFS' interim policy on artificial propagation (April 5, 1993, 58 FR 17573), the progeny of fish from a listed population that are propagated artificially are considered part of the listed species and are protected under the ESA. Thus, although not specifically designated in the 1991 listing, Snake River sockeye salmon produced in the captive broodstock program are included in the listed ESU. Given the dire status of the wild population under any criteria, NMFS considers the captive broodstock and its progeny essential for recovery. Critical habitat, which includes the nursery lakes in the upper Salmon River drainage and the migration route in the Snake and Salmon Rivers, was designated for Snake River sockeye salmon on December 28, 1993 (58 FR 68543).

Snake River sockeye salmon adults enter the Columbia River primarily during June and July. Arrival at Redfish Lake, which now supports the only remaining indigenous run of Snake River sockeye salmon, peaks in August and spawning occurs primarily in October (Bjornn *et al.* 1968). The population level was enumerated at 16 wild and 264 hatchery-produced adults returning to the Stanley basin between 1990 and 2000. NMFS considers the risk of extinction to be very high, due to a number of factors including the very small founder population size, the necessary reliance upon an artificial propagation environment, and the poor survival through the migration corridor.

3.1.2 Snake River fall chinook salmon

The Snake River fall chinook salmon ESU, listed as threatened on April 22, 1992 (67 FR 14653), includes all natural-origin populations of fall chinook in the mainstem Snake River and several

tributaries including the Tucannon, Grande Ronde, Salmon, and Clearwater Rivers. Fall chinook from the Lyons Ferry Hatchery are included in the ESU but are not listed. Critical habitat, which includes all waters of the Snake River basin used by fall chinook, was designated for Snake River fall chinook salmon on December 28, 1993 (58 FR 68543).

The spawning grounds between Huntington (river mile 328) and Auger Falls (river mile 607) were historically the most important for this species. Only limited spawning activity was reported downstream from river mile 273 (Waples *et al.* 1991), about one mile upstream of Oxbow Dam. Snake River fall chinook are currently limited to the area below Hells Canyon Dam (river mile 247). Adult Snake River fall chinook salmon enter the Columbia River in July, migrate into the Snake River from August through October and generally spawn from October through November.

There are no reliable estimates of historical population sizes of Snake River fall chinook salmon. The mean number of adults was estimated to have declined from 72,000 in the 1930s and 1940s to 29,000 during the 1950s. In spite of these declines, the Snake River was the most important area of natural production of fall chinook in the Columbia River through the 1950s. The number of adults counted at the uppermost Snake River mainstem dams averaged 12,720 total spawners from 1964 to 1968, 3,416 spawners from 1969 to 1974, and 610 spawners from 1975 to 1980 (Waples *et al.* 1991). Counts of natural-origin spawners continued to decline through the 1980s, and reached a low of 78 in 1990. Since 1990, returns of natural-origin fish to Lower Granite Dam have been variable, but increasing with 797 in 1997 and 306 in 1998. At the present time, numbers of naturally spawning fall chinook are increasing in the Snake River primarily due to supplemental releases of Lyons Ferry hatchery juveniles. The success of natural reproduction from these hatchery-produced returnees is uncertain.

The Northwest Fisheries Science Center recently considered the extinction risk for Snake River fall chinook salmon as part of their Cumulative Risk Initiative. The results of these analyses indicate that the probability of extinction for Snake River fall chinook over the next ten years is near zero, while the risk of extinction over 100 years is between 6-17% (depending on whether 1980 is included in the baseline analysis).

3.1.3 Snake River steelhead

Information on general steelhead biology can be found in NMFS (2000a), NMFS (2000b), and Busby *et al.* (1996).

Snake River steelhead were listed as threatened under the ESA in 1997. Snake River basin steelhead are an inland species that occupy the Snake River basin of southeast Washington, northeast Oregon, and Idaho. Historically, steelhead ascended the Snake River up to Rock Creek (river mile 704), but have been limited to below Hells Canyon Dam (river mile 247) since 1964. The Snake River historically supported more than 55 percent of total natural-origin production of steelhead in the Columbia River basin. It now has approximately 63 percent of the basin's natural production potential (Mealy 1997). The current spawning range of this species include

the Salmon, Pahsimeroi, Lemhi, Selway, Clearwater, Wallowa, Grande Ronde, Imnaha, and Tucannon Rivers.

Snake River steelhead, like most inland steelhead, are "summer-run" which means they enter freshwater nine or ten months before spawning. Snake River steelhead enter fresh water from June to October and spawn in the following spring from March to May. The two components, A-run and B-run, are distinguished by their size, timing of their respective adult migrations, and ocean-age. The B-run steelhead occupy four major subbasins, including two on the Clearwater River (Lochsa and Selway) and two on the Salmon River (Middle Fork and South Fork), areas that are for the most part not occupied by A-run steelhead. Some natural B-run steelhead are also produced in parts of the mainstem Clearwater and its major tributaries. The A-run steelhead are widely distributed throughout the remaining available habitat.

No estimates of historical (pre-1960s) abundance specific to Snake River steelhead are available. In general, steelhead abundance declined sharply in the early 1970s, rebuilt modestly from the mid-1970s through the 1980s, and declined again during the 1990s. Although, the total (hatchery + natural) run size has increased since the mid-1970s, the majority of natural stocks have been declining. Parr densities in natural production areas have been substantially below estimated capacity in recent years. Downward trends in the 1990s and low parr densities indicate a particularly sever problem for B-run steelhead, whose loss would substantially reduce life history diversity of Snake River Basin steelhead.

The longest consistent indicator of steelhead abundance in the Snake River basin is derived from counts of natural-origin steelhead at the uppermost dam on the lower Snake River. According to these estimates, the abundance of natural-origin summer steelhead at the uppermost dam on the Snake River declined from a 4-year average of 58,300 in 1964 to a 4-year average of 8,300 ending in 1998. More recently, natural-origin summer steelhead abundance has increased with the 1999 to 2001 average being 26,600.

3.1.4 Snake River spring/summer chinook salmon

The Snake River spring/summer chinook salmon ESU, listed as threatened on April 22, 1992 (67 FR 14653), includes all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, and Salmon Rivers. Some or all of the fish returning to several of the hatchery programs are also listed, including those returning to the Tucannon, Imnaha, and Grande Ronde River hatcheries, and to the Sawtooth, Pahsimeroi, and McCall hatcheries on the Salmon River. Critical habitat was designated for Snake River spring/summer chinook salmon on December 28, 1993 (58 FR 68543) and was revised on October 25, 1999 (64 FR 57399). Spring/summer chinook salmon returning to the Clearwater River basin are not listed nor included in the listed ESU. At the time of listing, NMFS determined that spring/summer chinook in the Clearwater River are progeny of hatchery-produced salmon that were reintroduced after the indigenous native stock was extirpated by impassable dams.

Most Snake River spring/summer chinook salmon enter individual subbasins from May through September. The present range of spawning and rearing habitat for naturally-spawned Snake

River spring/summer chinook salmon is primarily limited to the Salmon, Grande Ronde, Imnaha, and Tucannon subbasins.

In the late 1800s, the population of wild, adult Snake River spring/summer chinook salmon was estimated at more than 1.5 million adults. By the 1950s, the population had declined to an estimated 125,000 adults and continued to decline through the 1970s. Returns were variable through the 1980s, but declined further in the 1990s. Record low returns were observed in 1994 and 1995 after which a modest increase occurred through 2000. From 2001 through 2004 there has been a substantial increase in natural escapement. Annual returns have averaged over 25,000 natural-origin spring/summer chinook which are the most abundant runs of natural-origin chinook in over 30 years (Table 2). In these same years, the hatchery-origin spring/summer chinook returns have ranged between 60,000 and 150,000 adult fish, providing fish in excess of hatchery broodstock needs and supporting recreational fishing (FPC 2004).

There is little natural production area in the Snake River upstream of the Imnaha River. The Smolt Density Model (StreamNet 2001) shows that this area of the Snake River comprises 0.04% of the spring and summer chinook production potential upstream of Lower Granite Dam. Only two small, steep, tributaries (Sheep Creek and Granite Creek) are judged to be potential production areas for spring chinook salmon. Unmarked spring chinook are intercepted at the Hells Canyon Dam trap annually. The unmarked proportion trapped averaged 6.6% from 1997 through 2000 and ranged from 1.5% to 10.8%. However, there is high probability that most, if not all, of these fish are missed-clipped Rapid River Hatchery chinook salmon. Because smolts released into the Snake River at Hells Canyon Dam are reared at Rapid River Hatchery, the same proportion of mis-marked hatchery fish is expected to return to Hells Canyon (IDFG 2002a).

In Little Salmon River, excluding Rapid River, natural production potential is limited. The mainstem is steep and cascading and has been highly modified by construction and maintenance of U.S. Highway 95, which forms one bank of the river for most of its length. There is very little spawning gravel, and pool habitats are limited. Some suitable spawning and rearing habitat is available in Hazard, Hard, and Boulder Creeks. Over the past 35 years, several hundred thousand Rapid River Hatchery smolts have been released at the mouth of Hazard Creek and thousands of returning adult salmon have been redistributed from Rapid River Hatchery to Hazard Creek and its vicinity for fishery augmentation and natural spawning.

At the inception of the Rapid River Hatchery program, there was a small group of relatively later-timed fish that returned to the hatchery weir each year. These were presumed to be the progeny of natural production in the system, and representative of an indigenous wild population of Snake River spring/summer chinook salmon. Hatchery personnel allowed chinook to pass the hatchery weir based on time of arrival at the weir and visual identification of the “bright” fish. Fisheries were managed to minimize impacts on this later-timed component. For the first 25 years of Rapid River hatchery operation (roughly 1967 to 1992), hatchery fish were not differentially marked and there were relatively few tags on either hatchery or naturally produced fish, so the separation of fish at the weir into hatchery and natural components depended on timing, visual characteristics and the judgement of hatchery personnel. Recent information suggests that this group of later-timed, unmarked fish that return to the Rapid River weir are not genetically

Table 2. Estimates of natural-origin Snake River spring/summer chinook salmon counted at Lower Granite Dam (ODFW and WDFW 2004).

Year	Spring Chinook	Summer Chinook	Total
1979	2,573	2,714	5,287
1980	3,478	2,404	5,882
1981	7,941	2,739	10,680
1982	7,117	3,531	10,648
1983	6,181	3,219	9,400
1984	3,199	4,229	7,428
1985	5,245	2,696	7,941
1986	6,895	2,684	9,579
1987	7,883	1,855	9,738
1988	8,581	1,807	10,388
1989	3,029	2,299	5,328
1990	3,216	3,342	6,558
1991	2,206	2,967	5,173
1992	11,134	441	11,575
1993	5,871	4,082	9,953
1994	1,416	183	1,599
1995	745	343	1,088
1996	1,358	1,916	3,274
1997	2,126	5,137	7,263
1998	5,089	2,913	8,002
1999	1,104	1,584	2,927
2000			3,334
2001			17,186
2002			34,125
2003			38,881
2004			21,306 [1]
Recovery Escapement Levels (counted at Ice Harbor Dam)			31,400

[1] *based on 52% of the preseason estimate*

distinct from the hatchery fish (P. Moran, NMFS, pers. comm.). Comparison of arrival timing at the Rapid River weir of marked and unmarked adult chinook since the mid-1990s shows that there is no differentiation in timing.

The Northwest Fisheries Science Center has recently considered the extinction risk for Snake River spring/summer chinook salmon as part of their Cumulative Risk Initiative, which was based on seven "index" populations (out of a total of 35 to 40 populations). Two populations have a 10 percent risk of declining to one individual in ten years, four populations have 56 to 88

percent risk of declining to one individual in100 years, and the remaining populations have more than 30 percent probability of declining to this level within 100 years if nothing changes.

3.2 Critical Habitat

Critical habitat encompasses accessible reaches of all rivers (including estuarine areas and tributaries) within the range of each listed ESU. Critical habitat includes all waterways, substrate, and adjacent riparian zones below longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). Critical habitat for Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon was designated on December 28, 1993 (58 FR 68543).

Essential features of critical habitat include adequate (1) substrate (especially spawning gravel). (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) migration conditions (see 58 FR 68546, December 29, 1993, for Snake River salmon). These features are nearly identical to those characterized as Essential Fish Habitat (EFH) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Critical habitat for Snake River Basin steelhead was designated February 16, 2000 (65 FR 7764); this designation was vacated by the District of Columbia District Court and remanded to NMFS for new rulemaking pursuant to a court order in May 2002. On December 14, 2004, NMFS published a proposed rule in the Federal Register that would designate critical habitat for twenty listed ESUs of salmon and steelhead, including Snake River steelhead (69 FR 74572). The proposed harvest activities would take place in areas proposed to be designated as critical habitat. In the absence of a new rule designating critical habitat for Snake River steelhead, this consultation will include an evaluation of the effects of the proposed actions on the species' habitat to determine whether those actions are likely to jeopardize the species' continued existence. In determining what areas to consider for designation as critical habitat, regulations require NMFS to include in its consideration "primary constituent elements" (PCEs) "that are essential to the conservation of the species" (50 CFR 424.12(b)). The proposed critical habitat designation explicitly lists PCEs pertinent to each species in each watershed, and identifies management activities (such as forestry, grazing, and urbanization, among others) that may affect the PCEs for that watershed and which therefore may require special management considerations or protection. Migration PCEs exist for Snake River steelhead in most subbasins in which the proposed fisheries may occur. However, harvest activities are not specifically identified in any of the watersheds in which Snake River steelhead may be affected by the proposed action. More detailed habitat information (i.e., specific watersheds and habitat features, PCEs specifically applicable in each watershed, and special management considerations) for the Snake River Basin steelhead ESU can be found in the proposed designation (69 FR 74572, December 14, 2004).

3.3 Environmental Baseline

The environmental baseline for this consultation is the result of several forms of activities, summarized below, that affect the survival and recovery of Snake River sockeye salmon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, and Snake River steelhead. The biological requirements of Snake River sockeye salmon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, and Snake River steelhead are currently not being met under their respective environmental baselines. Their status is such that there must be a substantial improvement in the environmental conditions of the species' respective habitats (over those currently available under the environmental baselines). Any further degradation of the environmental conditions would have a considerable impact due to the amount of risk the species presently face under the environmental baselines. In addition, there must be improvements to minimize impacts due to hydro power dams, incidental harvest, hatchery practices, and unfavorable estuarine and marine conditions.

The best scientific information presently available suggests that a multitude of factors, past and present, have contributed to the decline of West Coast salmonids. NMFS reviewed much of that information in its recent consultation on operation of the Federal Columbia River Power System (FCRPS) (NMFS 2000b), and that review is summarized here. NMFS recognizes that natural environmental fluctuations have likely played a role in the species' recent declines. However, NMFS believes that other human-induced impacts (e.g., harvest in certain fisheries, artificial propagation, water diversions, and widespread habitat modification) have played an equally important role in the decline of these species.

3.3.1 The Species' Biological Requirements in the Action Areas

The action area for this consultation includes portions of the Clearwater River drainage, mainstem Snake River upstream from Lewiston, Idaho, the Salmon River, the South Fork Salmon River, and the Little Salmon River for chinook fisheries (see Figure 1). The action area for steelhead fisheries includes portions of the Clearwater Basin, mainstem Snake River, Little Salmon river, and mainstem Salmon River (see Figure 1).

Snake River sockeye salmon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, and Snake River steelhead reside in, or migrate through, the action areas considered in this consultation. The biological requirements during the species' life history stages can be obtained by identifying the essential features of their habitat (described in subsection 3.2, above). These have been fully discussed in recent biological opinions (NMFS 2000b) and what follows is a brief summary of the factors that affect these requirements in the action areas.

3.3.2 Hydropower System Effects

Anadromous salmonids in the Columbia River basin have been dramatically affected by the development and operation of the FCRPS on the lower Snake and Columbia Rivers. Storage dams have eliminated spawning and rearing habitat and have altered the natural hydro graph of

the Snake and Columbia Rivers, decreasing spring and summer flows and increasing fall and winter flows. Power operations cause flow levels and river elevations to fluctuate, affecting fish movement through reservoirs and riparian ecology, and stranding fish in shallow areas. The dams in the migration corridor alter smolt and adult migrations. Smolts experience a high level of mortality passing the dams. The dams also have converted the once-swift river into a series of slow-moving reservoirs, slowing the smolts' journey to the ocean and creating habitat for predators. Water velocities throughout the migration corridor now depend far more on runoff volume than before the development of the mainstem reservoirs.

There have been numerous changes in the operation and configuration of the FCRPS as a result of ESA consultations between NMFS and the Bonneville Power Administration (BPA), the U.S. Army Corps of Engineers (Corps), USFWS, and the Bureau of Reclamation (BOR). The changes have improved survival for the ESA-listed fish migrating through the Snake and Columbia Rivers. Increased spill at the dams allows smolts to avoid both turbine intakes and bypass systems. Increased flow in the mainstem Snake and Columbia Rivers reduces in river travel time for smolts. The transportation of smolts from the Snake River has also benefitted by operational improvements such as addition of new barges and modification of existing barges. In addition to spill, flow, and transportation improvements, the Corps implemented numerous other changes to project operations and maintenance at all FCRPS dams on the Snake and Columbia Rivers.

It is possible to quantify the survival benefits accruing from many of these strategies for each of the ESA-listed anadromous fish ESUs. For Snake River spring/summer chinook salmon smolts migrating in river, the estimated survival through the hydro system is now between 40 percent and 60 percent, compared with an estimated survival rate during the 1970s of 5 percent to 40 percent. Snake River steelhead have probably reacted similarly because their life history and run timing are similar to those of spring/summer chinook salmon (NMFS 2000b). It is more difficult to obtain direct data and compare survival for fish transported from the Snake River, but there are likely to be improvements for transported fish as well. It is reasonable to expect that the recent changes in operation and configuration of the FCRPS will benefit all ESA-listed Columbia River basin salmonids and that the proportional benefits will likely be greater the farther upriver the ESU. However, further improvements are necessary because the Federal hydro system continues to cause a considerable level of mortality for some ESUs.

3.3.3 Habitat Effects

The quality and quantity of freshwater habitat in much of the Columbia River basin have declined dramatically in the last 150 years. Forestry, agriculture, road construction, hydro system development, mining, and urbanization have radically changed the quality and reduced the quantity of historical habitat conditions of the basin. With the exception of fall chinook, which generally spawn and rear in the mainstem rivers, salmon and steelhead spawning and rearing habitat is found in the tributaries to the Snake and Columbia Rivers. Anadromous fish typically spend from a few months to three years rearing in freshwater tributaries. Depending on the species, they spend from a few days to an extended period of time in the Columbia River estuary

before migrating out to the ocean. They spend another one to four years in the ocean before returning as adults to spawn in their natal streams.

Water quality in streams throughout the Columbia River basin has been degraded by human activities such as dams and diversion structures, water withdrawals, farming and animal grazing, road construction, timber harvest activities, mining activities, and urbanization. Over 2,500 streams and river segments and lakes do not meet Federally-approved, state and Tribal water quality standards and are now listed as water-quality-limited under Section 303(d) of the Clean Water Act. Tributary water quality problems contribute to poor water quality where sediment and contaminants from the tributaries settle in mainstem reaches and the estuary.

Most of the water bodies in Oregon, Washington, and Idaho that are on the 303(d) list do not meet water quality standards for temperature. Temperature alterations affect salmonid metabolism, growth rate, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Some common actions that result in high stream temperatures are the removal of trees or shrubs that directly shade streams, excessive water withdrawals for irrigation or other purposes, and warm irrigation return flows. Loss of wetlands and increases in groundwater withdrawals have contributed to lower base-stream flows, which in turn contribute to temperature increases. Channel widening and land uses that create shallower streams also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and the emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low levels of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also a key cause of habitat degradation and reduced fish production. Millions of acres of land in the basin are irrigated. Although some of the water withdrawn from streams eventually returns as agricultural runoff or groundwater recharge, crops consume a large proportion. Withdrawals affect seasonal flow patterns by removing water from streams in the summer (mostly May through September) and restoring it to surface streams and groundwater in ways that are difficult to measure. Withdrawing water for irrigation, urban, and other uses can increase temperatures, smolt travel time, and sedimentation. Return water from irrigated fields can introduce nutrients and pesticides into streams and rivers.

On a larger landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Forest and range management practices have changed vegetation types and density, which can affect the timing and duration of runoff. Many riparian areas, flood plains, and wetlands that once stored water during periods of high runoff have been developed. Urbanization paves over or compacts soil and increases the amount and pattern of runoff reaching rivers and streams.

Blockages that stop the downstream and upstream movement of fish exist at many agricultural, hydro system, municipal/industrial, and flood control dams and barriers. Highway culverts that are not designed for fish passage also block upstream migration. Migrating fish are diverted into unscreened or inadequately screened water conveyances or turbines, resulting in unnecessary mortality. While many fish-passage improvements have been made in recent years, manmade structures continue to block migrations or kill fish throughout the basin.

Land ownership has played a part in habitat and land-use changes. Federal lands, which compose 50 percent of the basin, are generally forested and influence upstream portions of the watersheds. While there is substantial habitat degradation across all ownerships, in general, habitat in many headwater stream sections is in better condition than in the largely non-Federal lower portions of tributaries (Doppelt *et al*. 1993; Frissell 1993; Henjum *et al*. 1994; Quigley and Arbelbide 1997). In the past, valley bottoms were among the most productive fish habitats in the basin (Stanford and Ward 1992; Spence *et al*. 1996; ISG 1996). Today, agricultural and urban land development and water withdrawals have considerably altered the habitat for fish and wildlife. Streams in these areas typically have high water temperatures, sedimentation problems, low flows, simplified stream channels, and reduced riparian vegetation.

Mainstem habitats of the Columbia and Snake Rivers have been affected by impoundments that have inundated large amounts of spawning and rearing habitat. Historically, fall chinook salmon spawned in the mainstem near The Dalles, Oregon, upstream to the Pend Oreille River in Washington and in the Snake River downstream of Shoshone Falls. Current mainstem production areas for fall chinook salmon are mostly confined to the Hanford Reach of the mid-Columbia River, mainstem Columbia River downstream from Bonneville Dam, and to the Hells Canyon Reach of the Snake River, with minor spawning populations elsewhere in the mid-Columbia River, and below the lower Snake River dams. Mainstem habitat in the Columbia and Snake Rivers has been reduced, for the most part, to a single channel, floodplains have been reduced in size, off-channel habitat features have been lost or disconnected from the main channel, and the amount of large woody debris (large snags/log structures) in rivers has been reduced. Most of the remaining habitats are affected by flow fluctuations associated with reservoir management.

The Columbia River estuary has also been changed by human activities. Navigation channels have been dredged, deepened and maintained, jetties and pile-dike fields have been constructed to stabilize and concentrate flow in navigation channels, marsh and riparian habitats have been filled and diked, and causeways have been constructed across waterways. Artificial islands have been constructed that now support some of the world's largest colonies of piscivorus birds. These actions have decreased the width of the mouth of the Columbia River to two miles and increased the depth of the Columbia River channel at the bar from less than 20 to more than 55 feet. More than 50 percent of the original marshes and spruce swamps in the estuary have been converted to industrial, transportation, recreational, agricultural, or urban uses. More than 3,000 acres of intertidal marsh and spruce swamps have been converted to other uses since 1948 (LCREP 1999). Many wetlands along the shore in the upper reaches of the estuary have been converted to industrial and agricultural lands after levees and dikes were constructed. Furthermore, water storage and release patterns from reservoirs upstream of the estuary have

changed the seasonal pattern and volume of discharge. The peaks of spring/summer floods have been reduced, and the amount of water discharged during winter has increased.

The Basinwide Recovery Strategy (Federal Caucus 2000) outlines a broad range of current programs designed to improve habitat conditions for anadromous fish. Because most of the basin's anadromous fish spawning habitat is in Federal ownership, Federal land management programs are of primary importance. Examples of Federal actions likely to affect salmonids in the ESA-listed ESUs include authorized land management activities of the USFS and Bureau of Land Management (BLM). Federal actions, including the Corps' section 404 permitting activities under the Clean Water Act, the Corps' permitting activities under the River and Harbors Act, National Pollution Discharge Elimination System permits issued by EPA, highway projects authorized by the Federal Highway Administration, Federal Energy Regulatory Commission licenses for non-Federal development and operation of hydropower, and Federal hatcheries may result in impacts to ESA-listed anadromous fish.

Several recovery efforts are underway that may slow or reverse the decline of salmon and steelhead populations. Notable efforts within the range of the Snake River salmonid ESUs are the Northwest Forest Plan (NFP), PACFISH, Washington Wild Stock Restoration Initiative, and Washington Wild Salmonid Policy. PACFISH is an ecosystem-based aquatic habitat and riparian-area management strategy that covers the majority of the basin accessible to anadromous fish and includes specific prescriptions designed to halt habitat degradation. PACFISH provides objectives, standards, and guidelines that are applied to all Federal land management activities such as timber harvest, road construction, mining, grazing, and recreation. USFS and BLM implemented PACFISH beginning in 1995. Several other efforts are also being carried forward by NMFS, USFS, and BLM. These components include implementation of monitoring, a system of watersheds that are prioritized for protection and restoration, improved and monitored grazing systems, road system evaluation and planning requirements, mapping and analysis of unroaded areas, multi-year restoration strategies, and batching and analyzing projects at the watershed scale.

The most substantive element of the NFP for anadromous fish is its Aquatic Conservation Strategy (ACS), a regional-scale aquatic ecosystem conservation strategy that includes: (1) Special land allocations (such as key watersheds, riparian reserves, and late-successional reserves) to provide aquatic habitat refugia; (2) special requirements for project planning and design in the form of standards and guidelines; and (3) new watershed analysis, watershed restoration, and monitoring processes. These components collectively are designed so that Federal land management actions will achieve ACS objectives that strive to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and to restore currently degraded habitats.

The Basinwide Recovery Strategy also outlines a large number of non-Federal habitat programs. Because non-Federal habitat is managed predominantly for private rather than public purposes, expectations for non-Federal habitat are harder to assess. Degradation of habitat for ESA-listed fish from activities on non-Federal lands is likely to continue to some degree, although at a reduced rate due to state, tribal, and local recovery plans. Because a substantial portion of land in

the ESA-listed salmonid ESUs is in state or private ownership, conservation measures on these lands will be key to protecting and recovering ESA-listed salmon and steelhead populations. NMFS recognizes that strong conservation benefits will accrue from specific components of many non-Federal conservation efforts, however, some of those conservation efforts are very recent and few address salmon conservation at a scale that is adequate to protect and conserve entire ESUs. NMFS will continue to encourage non-Federal landowners to assess the impacts of their actions on ESA-listed salmonids. In particular, NMFS will encourage state and local governments to use their existing authorities and programs, and will encourage the formation of watershed partnerships to promote conservation in accordance with ecosystem principles.

3.3.4 Hatchery Effects

For more than 100 years, hatcheries in the Pacific Northwest have been used to replace natural production lost as a result of the construction of hydropower dams, other development, and to enhance fisheries, not to protect and rebuild naturally-produced salmonid populations. As a result, most salmonid populations in the region are primarily hatchery fish. In 1987, for example, 95 percent of the coho salmon, 70 percent of the spring chinook salmon, 80 percent of the summer chinook salmon, 50 percent of the fall chinook salmon, and 70 percent of the steelhead returning to the Columbia River basin originated in hatcheries (CBFWA 1990). While hatcheries certainly have contributed greatly to the overall numbers of salmonids, only recently has the effect of hatcheries on native wild populations been demonstrated. In many cases, these effects have been substantial. For example, the production of hatchery fish, among other factors, has contributed to the 90 percent reduction in wild coho salmon runs in the lower Columbia River over the past 30 years (Flagg *et al.* 1995).

NMFS has identified four primary categories of risk that hatcheries can pose on wild-run salmon and steelhead: (1) ecological effects, (2) genetic effects, (3) overharvest effects, and (4) masking effects (NMFS 2000a). Ecologically, hatchery fish can increase predation on, displace, and/or compete with wild fish. These effects are likely to occur when fish are released in poor condition and do not migrate to marine waters, but rather remain in the streams for extended rearing periods during which they may prey on or compete with wild fish. Hatchery fish also may transmit hatchery-borne diseases, and hatcheries themselves may release diseases into streams via water effluents. Genetically, hatchery fish can affect the genetic variability of native fish via interbreeding, either intentionally or accidentally. Interbreeding can also result from the introduction of stocks from other areas. Theoretically, interbred fish are less well adapted to the unique local habitats where the original native stock evolved and therefore are less productive in those habitats. Most of these hatchery impacts can not be quantified, but collectively may have been a factor in the decline of individual populations of listed Snake Basin ESUs.

NMFS determined that there is a need for immediate hatchery reform and conservation actions (Federal Caucus 2000). Federal agencies are working with the Northwest Power Planning Council (NWPPC) to accelerate funding and implementation of the reform measures from the hatchery biological opinions and related actions that should proceed over the next 1 to 3 years. Such reforms will be pursued in the context of the Hatchery and Genetic Management Plans (HGMP). The HGMP is a tool for defining goals and objectives of a particular hatchery, and its

relationship to prioritized basin objectives, including harvest opportunities and wild stock performance. Specifically, each HGMP, when appropriately prepared, will ensure that genetic broodstock selected is appropriate, that it minimizes the potential for adverse ecological effects on wild populations, and that it is integrated into basinwide strategies to meet broader objectives. Future management of hatcheries will also need to occur within the context of fully implemented adaptive-management programs that focus on watershed management, not just on the fish themselves (NRC 1996).

3.3.5 Harvest Effects

Initially, non-Indian commercial fisheries targeted spring and summer chinook salmon, and these runs dominated the commercial harvest during the 1800s. Eventually the combined ocean and freshwater harvest rates for Columbia River spring and summer chinook salmon exceeded 80 percent and sometimes 90 percent of the run, contributing to the species' decline (Ricker 1959). From 1938 to 1955, the average harvest rate dropped to about 60 percent of the total spring chinook salmon run and appeared to have a minimal effect on subsequent returns (NMFS 1991). Until the spring of 2000, when a relatively large run of hatchery spring chinook salmon returned and provided a small commercial Tribal fishery, the last commercial season for spring chinook salmon had occurred in 1977.

The summer chinook salmon run could not sustain the average harvest rate of 88 percent that was applied between 1938 to 1944 and produced lower returns between 1942 and 1949 (NMFS 1991). From 1945 through 1949, the Columbia River harvest rate on summer chinook salmon was reduced to about 47 percent, and subsequently, the run size increased. The construction of Grand Coulee Dam in 1941, with the resulting inundation of summer chinook salmon spawning areas, was a primary factor influencing this species' declining abundance. In the 1950s and 1960s, harvest rates further declined to about 20 percent (Raymond 1988). This species has not been the target of any commercial harvest since 1963.

Following the sharp declines in spring and summer chinook salmon in the late 1800s, fall chinook salmon became a more important component of the catch. Fall chinook salmon have provided the greatest contribution to Columbia River salmon catches in most years since 1890. The peak year of commercial sales was 1911, when 49.5 million pounds of fall chinook salmon were landed. Columbia River chinook salmon catches were generally stable from the beginning of commercial exploitation until the late 1940s, when landings declined by about two-thirds to a level that remained stable from the 1950s through the mid-1980s (ODFW and WDFW 1999). Since 1938, total salmonid landings have ranged from a high of about 2,112,500 fish in 1941 to a low of about 68,000 fish in 1995 (ODFW and WDFW 1999).

The construction of The Dalles Dam in 1957 had a major effect on Tribal fisheries. The Dalles Reservoir flooded Celilo Falls and inundated the site of a major Indian fishery that had existed for millennia. Commercial Indian landings at Celilo Falls from 1938 through 1956 ranged from 0.8 to 3.5 million pounds annually, based primarily on dip netting (ODFW and WDFW 1999). With the elimination of Celilo Falls, salmon harvest in the area declined dramatically. In 1957, in a joint action, the states of Oregon and Washington closed the Tribal fishery above Bonneville

Dam to commercial harvesters. Treaty Indian fisheries that continued during 1957 through 1968 were conducted under Tribal ordinances. In 1968, with the Supreme Court opinion on the appeal of the *Puyallup v. Washington* case, the states reopened the area to commercial fishing by treaty tribes (ODFW and WDFW 1999). For the next 6 years, until 1974, only a limited Tribal harvest occurred above Bonneville Dam. Since the mid-1980s, state and tribal fisheries have been managed via management agreements under the *U.S. v. Oregon* forum.

3.3.6 Effects of Natural Conditions

Changes in the abundance of salmonid populations are substantially affected by changes in the freshwater and marine environments. Recent evidence suggests that marine survival of salmonids fluctuates in response to 20- to 30-year cycles of climatic conditions and ocean productivity (Hare *et al*. 1999). This phenomenon has been referred to as the Pacific Decadal Oscillation. For example, large-scale climatic regimes, such as El Niño, appear to affect changes in ocean productivity and influence local environmental rainfall patterns that can result in drought and fluctuating flows. During the first part of the 1990s much of the Pacific Coast was subject to a series of very dry years and very low stream flows. In more recent years, severe flooding has adversely affected some stocks. The Snake River ESUs are affected by this broad environmental cycle, thus the survival and recovery of these species will depend on their ability to persist through periods of low natural survival rates.

Studies begun in 1997 by the Oregon Cooperative Fish and Wildlife Research Unit, USGS, and CRITFC have shown that fish-eating birds that nest on man-made islands in the Columbia River estuary (Caspian terns, double-crested cormorants, and glaucous-winged gulls) are key avian predators of juvenile salmonids. Researchers estimated that the single tern colony on Rice Island (16,000 birds in 1997) consumed 6 to 25 million outmigrating smolts during 1997 (Roby *et al*. 1998) and 7 to 15 million outmigrating smolts during 1998 (Collis *et al*. 1999). The observed levels of predation prompted the regional fish and wildlife managers to investigate the feasibility of management actions to reduce the impacts. Early management actions appear to have reduced predation rates; researchers estimate that terns consumed 7.3 million smolts during 1999 (Columbia Bird Research 2000), and all of the tern colony potentially destined for Rice Island in 2001 and 2002 has shifted downstream to East Sand Island. However, terns, cormorants, gulls and pelicans nesting and roosting on other artificial islands in the estuary and hydropower reservoirs continue to consume many millions of smolts each year.

3.3.7 Effects of Scientific Research, Monitoring, and Enhancement

Snake River salmon and steelhead, like other ESA-listed fish, are the subject of scientific research, monitoring, and enhancement activities. Most biological opinions that NMFS issues recommend specific monitoring, evaluation, and research projects to gather information to aid in the survival of the ESA-listed fish. In addition, NMFS has issued numerous research and/or enhancement permits authorizing takes of ESA-listed fish over the past eight years. Each authorization for take by itself would not lead to decline of the species. However the sum of the authorized takes indicate a high level of research effort in the action area, and as anadromous fish stocks have continued to decline, the proportion of fish handled for research/monitoring purposes

relative to the total number of fish has increased. The effect of these activities is difficult to assess, nevertheless, the potential benefits to ESA-listed salmon and steelhead from the scientific information is likely to be greater than the potential risk to the species due to those efforts. Potential benefits include enhancing the scientific knowledge base for the species, answering questions or contributing information toward resolving difficult resource management issues, and directly enhancing the survival of the species. The information gained during research and monitoring activities is essential to assist resource managers in making more informed decisions regarding recovery measures. Moreover, scientific research, monitoring, and enhancement efforts are not considered to be a factor for the decline of salmon and steelhead populations.

To reduce adverse effects from research and enhancement activities on the species, NMFS imposes conditions in its permits so that Permit Holders are required to conduct their activities in such a way as to minimize adverse effects on the ESA-listed species, including keeping mortalities as low as possible. Also, researchers are encouraged to use non-listed fish species and/or ESA-listed hatchery fish, instead of ESA-listed, naturally-produced fish, for scientific research purposes when possible. In addition, researchers are required to share sample fish, as well as the results of the scientific research, with other researchers as a way to avoid duplicative efforts and to acquire as much information as possible from the ESA-listed fish sampled. NMFS works with other agencies to coordinate research to prevent duplication of effort.

In general, for research and enhancement projects that require a section 10(a)(1)(A) permit, applicants will provide NMFS with high take estimates to compensate for potential inseason changes to research protocols, accidental catastrophic events, and the annual variability in ESA-listed fish numbers. Also, most research projects depend on annual funding and the availability of other resources. So, a specific research project for which take of ESA-listed species is authorized by a permit may be suspended in a year when funding or resources are not available. Therefore, the actual take in a given year for most research and enhancement projects, as provided to NMFS in post-season annual reports, is usually less than the authorized level of take in the permits and the related NMFS consultation on the issuance of those permits. Therefore, because actual take levels tend to be lower than authorized takes, the severity of effects to the ESA-listed species are usually less than the effects analyzed in a typical consultation.

A substantial amount of the annual take of ESA-listed salmon and steelhead is related to assessing the impact of the hydropower dams on the mainstem Snake and Columbia Rivers. Scientific research, monitoring, and enhancement activities are required by the Reasonable and Prudent Alternative of the opinion on the FCRPS (NMFS 2000b). The Corps' Juvenile Fish Transportation Program results in a substantial amount of annual take of ESA-listed Snake River salmon and steelhead for enhancement purposes in the course of collecting salmon and steelhead smolts and transporting them around the hydropower dams and reservoirs. For a description of the annual takes of ESA-listed Snake River salmon and steelhead associated with the hydropower dams on the mainstem Snake and Columbia Rivers, refer to the December 21, 2000, FCRPS biological opinion (NMFS 2000b) and the biological opinion on the issuance of an amendment of ESA Section 10(a)(1)(A) Permit 1237 for takes of six endangered or threatened species for the purpose of enhancement issued on April 26, 2001.

4.0 EFFECTS OF THE ACTION

Federal agencies cannot undertake or authorize an action that is "likely to jeopardize the continued existence" of a species listed under the ESA. Joint NMFS-USFWS regulations define "jeopardize the continued existence of" to mean "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers or distribution of that species" (50 CFR 402.02). In the context of jeopardy, "survival" is "the condition in which a species continues to exist into the future while retaining the potential for recovery" (USFWS/NMFS 1998).

NMFS' approach to determining whether a proposed action is likely to jeopardize the continued existence of listed salmon and steelhead is based on the concept of Viable Salmonid Populations (VSP) published by NMFS in 2000 (McElhany *et al.* 2000). Four parameters form the key to evaluating the status of salmonid populations using the VSP approach: abundance, population growth rate, population spatial structure, and diversity. NMFS focuses on these parameters for several reasons. First, they are reasonable predictors of extinction risks (viability). Second, they reflect general processes that are important to populations of all species. For example, many factors influence abundance including habitat quality, interactions with other species, harvest programs and the artificial propagation programs. Many of these factors are species or ESU-specific. By focusing on abundance, general conclusions about an ESU's extinction risk may be drawn, even in the absence of detailed, species-specific information on all the factors that influence abundance. Third, the parameters are measurable. The VSP document provides guidelines for each parameter and discusses specific methods for measuring population status in the context of each parameter.

The reason that factors such as habitat quality or species interactions are not part of the viability criteria is that the effects of these factors are ultimately reflected in the four primary parameters that are considered. For example, a population's abundance and spatial structure are, to a large degree, determined by the quality and quantity of available habitat. The primary VSP factors affected by harvest actions considered in this Opinion will be abundance and growth rate and are the primary focus of the analysis that follows.

4.1 Factors to be Considered

Take associated with the proposed recreational fisheries is expected to occur primarily as incidental take associated with fisheries that target unlisted species and stocks. Recreational fishing can effect listed species directly through intentional illegal harvest, unintentional illegal harvest, hooking mortality of fish caught but released back into the stream, and the direct physical disturbance of fish. Angler access can affect habitat by trampling or removing riparian vegetation. Angling methods, including wading in streams and operating boats, can affect fish behavior and habitat. These are the factors upon which the following analysis is focused.

All of the proposed fisheries in the Snake River basin that target anadromous fish are selective, in that only unlisted, hatchery-produced fish marked by a clipped adipose fin are legal to harvest.

The adipose fin is excised from juvenile anadromous fish while they are rearing, prior to release from fish hatcheries. The healed scar and the missing fins are easily identified by anglers and fish with intact adipose fins are required to be released without removing them from the water. Other fisheries may be species-selective. For example, fall chinook are not to be retained during the steelhead season and juvenile steelhead or rainbow trout are not to be retained in waters only open to the harvest of brook trout or mountain whitefish. This basically allows fisheries to occur while allowing listed fish that are encountered in the fishery to continue on to spawn, though with some incidental mortality, which is discussed below.

4.1.1 Catch and Release Mortality

Fish that are caught in a recreational fishery and released alive may still die as a result of injuries or stress resulting from the capture method or handling. The likelihood of mortality varies widely, based on a number of factors including the gear type used, the species, the water conditions, and the care with which the fish is released. The fisheries proposed in this action are exclusively recreational fisheries using hook and line. General catch-and-release effects for steelhead and chinook salmon are discussed here, as detail for the effects analysis below.

Catch and Release mortality – adult steelhead
Idaho implemented catch and release fishing for adult wild steelhead beginning in the mid 1980s, which appreciably reduced fishing related mortality. The available information assessing hook and release mortality of adult steelhead suggests that hook and release mortality is low. Hooton (1987) found catch and release mortality of adult winter steelhead to average 3.4% (127 mortalities of 3,715 steelhead caught) when using barbed and barbless hooks, bait and artificial lures. Among 336 steelhead captured on various combinations of popular terminal gear in the Keogh River, the mortality of the combined sample was 5.1%. Natural bait had slightly higher mortality (5.6%) than did artificial lures (3.8%), and barbed hooks (7.3%) had higher mortality than barbless hooks (2.9%). Hooton (1987) concluded that catch and release of adult steelhead was an effective mechanism for maintaining angling opportunity without negatively impacting stock recruitment. Reingold (1975) showed that adult steelhead hooked, played to exhaustion, and then released returned to their target spawning stream at the same rate as steelhead not hooked and played to exhaustion. Pettit (1977) found that egg viability of hatchery steelhead was not negatively affected by catch-and-release of pre-spawning adult female steelhead. Bruesewitz (1995) found, on average, fewer than 13% of harvested summer and winter steelhead in Washington streams were hooked in critical areas (tongue, esophagus, gills, eye). The highest percentage (17.8%) of critical area hookings occurred when using bait and treble hooks in winter steelhead fisheries.

The referenced studies were conducted when water temperatures were relatively cool, and primarily involve winter-run steelhead. Data on summer-run steelhead and warmer water conditions are less abundant (Cramer and Associates 1997). Catch and release mortality of steelhead is likely to be higher if the fishery occurs during warm water conditions. In a study conducted on the catch and release mortality of steelhead in a California river, Taylor and Barnhart (1999) reported over 80% of the observed mortalities occurred at stream temperatures greater than 21˚C. Catch and release mortality during periods of elevated water temperature are

likely to result in post-release mortality rates greater than reported by Hooton (1987) because of warmer water and extended freshwater residence of summer fish which make them more likely to be caught. Although Snake River steelhead are summer-run fish which enter the Columbia River in July, August and September, the fisheries in the Snake River take place from September through April in cooling or cold (0 to 15˚C) water. As a result, NMFS expects steelhead hook and release mortality to be in the lower range discussed above.

Catch and release mortality – juvenile steelhead

Juvenile steelhead occupy many waters that are also occupied by resident trout species and it is not possible to visually separate juvenile steelhead from similarly-sized, stream-resident, rainbow trout. Because juvenile steelhead and stream-resident rainbow trout are the same species, are similar in size, and have the same food habits and habitat preferences, it is reasonable to assume that catch-and-release mortality studies on stream-resident trout are similar for juvenile steelhead. Where angling for trout is permitted, catch-and-release fishing with prohibition of use of natural or synthetic bait will reduce juvenile steelhead mortality more than any other angling regulatory change. Many studies have shown trout mortality to be higher when using bait than when angling with artificially lures and/or flies (Taylor and White 1992; Schill and Scarpella 1995; Mongillo 1984; Wydoski 1977; Schisler and Bergersen 1996). Wydoski (1977) showed the average mortality of trout when using bait to be more than four times greater than the mortality associated with using artificial lures and flies. Taylor and White (1992) showed average mortality of trout to be 31.4% when using bait versus 4.9% and 3.8% for lures and flies, respectively. Schisler and Bergersen (1996) reported average mortality of trout caught on passively fished bait to be higher (32%) than mortality from actively fished bait (21%). Mortality of fish caught on artificial flies was only 3.9%. In the compendium of studies reviewed by Mongillo (1984) mortality of trout caught and released using artificial lures and single barbless hooks was often reported at less than 2%.

In some fisheries that occur during the general trout season, larger hooks may reduce the efficiency of hooking juvenile steelhead because it will be more difficult for juveniles to swallow the bait (Muoneke and Childress 1994). Most studies have found little difference (or inconclusive results) in the mortality of juvenile steelhead associated with using barbed versus barbless hooks, single versus treble hooks, and different hook sizes (Schill and Scarpella 1995; Taylor and White 1992; Mongillo 1984). However, some investigators believe that the use of barbless hooks reduces handling time and stress on hooked fish and adds to survival after release (Wydoski 1977). In summary, catch-and-release mortality of juvenile steelhead is expected to be less than 10% and approaches 0% when fishermen are restricted to use of artificial flies and lures. Juvenile sockeye and juvenile chinook salmon are rarely encountered in trout fisheries, but it is expected that similar catch-and-release mortalities would occur on the small number of salmon encountered.

Catch and release mortality – chinook salmon

Only a few reports are available that provide empirical evidence showing what the catch and release mortality is for chinook salmon in freshwater recreational fisheries. The ODFW has conducted studies of hooking mortality incidental to the recreational fishery for chinook salmon in the Willamette River. A study of the recreational fishery estimates a per-capture hook-and-

release mortality for wild spring chinook in Willamette River fisheries of 8.6% (Schroeder *et al*. 2000), which is similar to a mortality of 7.6% reported by Bendock and Alexandersdottir (1993) in the Kenai River, Alaska.

A second study on hooking mortality in the Willamette River, Oregon, involved a carefully controlled experimental fishery, and mortality was estimated at 12.2% (Lindsay *et al.* 2004). In hooking mortality studies, hooking location and gear type is important in determining the mortality of released fish. Fish hooked in the jaw or tongue suffered lower mortality (2.3 and 17.8% in Lindsay *et al.* (2004)) compared to fish hooked in the gills or esophagus (81.6% and 67.3%). A large portion of the mortality in the Lindsay *et al.* (2004) study was related to deep hooking by anglers using prawns or sand shrimp for bait on two-hook terminal tackle. Other baits and lures produced higher rates of jaw hooking than shrimp, and therefore produced lower hooking mortality estimates. The Alaska study reported very low incidence of deep hooking by anglers using lures and bait while fishing for salmon. The IDFG believes that the lures and bait (primarily salmon eggs on single barbless hooks) used in the Salmon River fisheries will produce hooking mortality rates more similar to those reported in the Alaska study, and believes that the 10% per-capture mortality rate in their application is conservative.

Based on the available data, the *U.S. v. Oregon* Technical Advisory Committee has adopted a 10 percent rate in order to make conservative estimates of incidental mortality in fisheries (R. Bayley, NMFS, pers. comm.). For similar reasons, NMFS currently applies the 10 percent rate to provide conservative estimates of the hook and release mortality when evaluating the impact of proposed recreational fisheries. The number of listed fish that are hooked is reduced by adopting open season dates that avoid the timing of listed runs and by not allowing fishing in areas where listed fish are expected to predominate.

4.1.2 Harassment

Take by harassment could occur due to angling activities. NMFS (2000a) provides a detailed discussion of the impacts of wading and boat use on anadromous fish. While both boat use and wading have the potential to disturb spawning fish and incubating eggs, the combination of specific circumstances where fishing activities would have measurable affects on the survival of fish or fish eggs rarely, if ever, occurs in the Snake River basin. Wading can harm trout eggs that are buried at shallow depths in small gravel, but is not likely to harm salmon eggs that are buried deeply in large gravel and cobble. Powerboat use can disturb fish or eggs in shallow water, but powerboat use for fishing does not occur in areas where steelhead and spring chinook spawn in shallow water. Fall chinook spawn in areas where powerboats are used, but fall chinook spawn in deeper water and larger substrate. Float boat use in shallow water may displace fish, but does no lethal harm to fish and eggs. Harassment of fish and destruction of fish or eggs is prohibited by Idaho law and regulations.

Habitat impacts of fishing activities are usually localized and short-lived and are not likely to have biological significance at the population or ESU level. Neither the research reporting on boat use nor the study of wading impacts identify population-level impacts or lead to the conclusion that angler activity would be a factor of decline or a limiting factor to the affected

populations. The potential for take resulting from such activities would be limited through state management and monitoring of fishing access areas, and the effects of such take will be subsumed by the analysis of take resulting from actual catch and retention or release.

4.2 Specific Effects

4.2.1 Snake River Sockeye Salmon

The recreational fisheries proposed to be implemented in the mainstems of the Snake and Salmon Rivers are not expected to affect Snake River sockeye salmon. Sockeye adults typically return to the Snake River basin from July through September, primarily in July and August. The Snake River fishery will close in early June and Salmon River fishery by mid-July, prior to the time most sockeye salmon adults would be expected to pass through these areas. Sockeye adults are not commonly caught in the tributary areas and none have been reported in Idaho fisheries since the 1970s.

Some impacts on juvenile sockeye salmon may occur in proposed fisheries targeting kokanee and resident trout in the Stanley Basin lakes.

In the three lakes in Stanley Basin in the upper Salmon River drainage where sockeye salmon are present, the most numerous species present and sought by fishermen are kokanee and hatchery-produced rainbow trout. Bull trout are present in moderate numbers, as are westslope cutthroat trout.

Stocking of hatchery rainbow trout in Redfish Lake was terminated following the listing of Snake River sockeye salmon and fishing was closed. In the absence of the anadromous form of *O. nerka*, and with no angling harvest, the kokanee population of Redfish Lake increased rapidly and the Shoshone-Bannock Tribes (SBT), who initially petitioned for listing of Redfish Lake sockeye and who manage the lakes in cooperation with the state and Federal agencies, produced documentation that 92 percent of the productivity of the lake was taken up by the standing crop of kokanee (NMFS 1995b). In 1995, in consultation with NMFS and the Shoshone-Bannock Tribes, the IDFG determined that the harvest of kokanee by anglers would benefit the listed sockeye by reducing competition. Take of ESA-listed sockeye resulting from the kokanee fishery was authorized in Modification 1 of Permit #844, issued by NMFS on July 14, 1995, and subsequently reauthorized annually in Modification 2 (May 24, 1996), Modification 3 (June 17, 1997), and Modification 4 (May 18, 1997), and in Permit 1150 issued May 27, 1999. Sockeye salmon were reintroduced to Pettit and Alturas Lakes in 1995 and 1997, respectively, where recreational fisheries for stocked rainbow trout continued as established. Proposed recreational fisheries were coordinated with NMFS and conducted according to permit guidelines and conditions that include monitoring of fisheries for harvest of listed species and trout for signs of predation on sockeye juveniles.

Data provided by IDFG (1999) indicate that recreational fisheries in Redfish, Pettit, and Alturas Lakes can be conducted without jeopardizing the continued existence of ESA-listed sockeye or ongoing recovery efforts. Very few ESA-listed sockeye have been reported in the fishery

because the majority of both hatchery and naturally produced juveniles emigrate from the lakes in their second year of life at lengths less than 150 mm, before they reach a size that is recruited to recreational fisheries. The exception to this circumstance is the presence of listed residual sockeye in Redfish Lake.

In three years of monitoring kokanee fisheries in Redfish Lake, 1995-1997, IDFG reports the catch of an estimated 6,382 kokanee resulted in the catch-and-release of fewer than 45 listed juvenile or residual sockeye (IDFG 1999). The annual take authorized by Permit #844 was 34 fish, based on an annual harvest of up to 3,400 kokanee and knowledge that less than 1 percent of the mixed population was residual sockeye. The actual harvest has been less than 15 residual sockeye salmon per year. This harvest proportion is sampled by mitochondrial DNA analysis of adipose fins clipped from *O. nerka* sampled in the recreational fishery catch. In three years of sampling in Redfish Lake and one year of sampling in Pettit Lake, only one "holdover" sockeye was captured – a 2 year-old sockeye was captured from Pettit Lake in 1996 during trawling efforts that also captured 107 kokanee, indicating that the potential for juvenile sockeye to reach a size recruited to the fishery is small. To provide further protection, all ESA-listed, hatchery-produced sockeye salmon are adipose-fin-clipped and must be released by anglers. The IDFG has conducted an information and education campaign to make anglers aware of this rule. In four fishing seasons, no hatchery-produced juvenile sockeye were detected in the creel census. Removal of resident kokanee from the sockeye lakes by angling is part of an overall management plan to increase production of anadromous sockeye which includes whole-lake fertilization being conducted by the SBT. The management of the sockeye captive broodstock program and the recovery plan for naturally spawning sockeye in the lakes is coordinated by the Stanley Basin Sockeye Technical Oversight Committee (SBSTOC) which includes IDFG, SBT, NMFS, and Bonneville Power Administration (BPA), who funds and coordinates contracts. All proposals for fisheries and releases are coordinated through and approved by the SBSTOC.

The IDFG estimates that the take of residual sockeye salmon in Redfish Lake, incidental to recreational fisheries for kokanee and trout, will be no more than 15 unmarked residual, ESA-listed sockeye salmon. This calculation is based on estimates of the number of kokanee of a size to be recruited to the fishery and the number of listed fish that might be present in the lakes under current management plans. The IDFG requests a new authorization for the incidental take of up to 1 ESA-listed, hatchery-produced juvenile sockeye salmon in each of the three Stanley Basin lakes – Redfish, Pettit, and Alturas Lakes – where listed sockeye salmon now occur, although none have yet entered the fishery, through five years of monitoring. In terms of biological effects, the sockeye juveniles that remain resident in the lakes for the three or four years that are required to grow large enough to enter the fishery are not likely to contribute to recovery of anadromous sockeye.

Adult sockeye are protected by salmon fishing closures and general regulations, which prohibit fishing for and possession of adult anadromous salmon. General Regulation fisheries for resident fish are not expected to pose an unacceptable level of risk to returning adult sockeye salmon. No catch or harvest of sockeye in recreational fisheries has been reported in the past 20 years. In the event that unusual circumstances occur that may pose risk to listed sockeye salmon, the Idaho Fish and Game Commission has the authority to close the fishery immediately.

No take of juvenile sockeye is expected in streams or rivers because they are not pursued by anglers and they are not vulnerable to angling, primarily due to their size (≤ 140mm) and river conditions during migration. Sockeye juveniles migrate from late April through late May, prior to the opening of general fishing season and during high water conditions (IDFG 1993).

4.2.2 Snake River Fall Chinook Salmon

The proposed spring/summer chinook recreational fisheries are not expected to affect Snake River fall chinook salmon. The proposed spring/summer chinook salmon recreational fisheries end no later than August 7, prior to the expected arrival of listed Snake River fall chinook salmon.

Fall chinook salmon adults only occur in the main stems of the Snake River and the lower reaches of the major tributaries, primarily in October and November. This provides a time and space separation from trout fisheries and most other resident-species fisheries which could impact fall chinook . There is limited overlap between fisheries for bass and catfish which take place primarily in spring and summer months, and the presence of fall chinook. Most anglers fish for steelhead during the months when fall chinook are present, and the most likely fishery to encounter fall chinook is the fishery that targets hatchery-origin steelhead.

As fall chinook salmon abundance has increased since 2000, the frequency of incidental catch-and-release in fall steelhead seasons has increased. The previous iteration of the IDFG recreational fishery permit analyzed a maximum of 50 incidental captures of fall chinook salmon. In the past five years (2000-2004), fall chinook salmon returns above Lower Granite Dam have averaged over 10,000 adults and 5,000 jacks, compared to 1,800 adults and 1,000 jacks in the preceding 5 years. The IDFG estimates that up to 1.5% of the fall chinook passing Lower Granite Dam may be encountered in steelhead fisheries, which at the current average would be approximately 150 adults and 75 jacks. Harvest of fall chinook salmon would continue to be prohibited under the proposed permit. Therefore, because effects on fall chinook salmon will be essentially limited to incidental mortality as a result of catch-and-release injury, the likely mortality as a result of the fisheries is small, estimated by applying a 10% mortality rate to 1.5% of the population resulting in an impact of 0.15% of the portion of the population escaping upstream of Lower Granite Dam, or roughly 15 fish out of 10,000 adult fall chinook at the current run level. This level of impact is not expected to have a measurable effect on the increasing abundance of fall chinook salmon.

4.2.3 Snake River Steelhead

Snake River steelhead listed under the ESA may be affected by the proposed fisheries in several ways and at several different life stages. The primary impact is catch and release of listed, adult, natural-origin steelhead incidental to fisheries targeting non-listed, hatchery-origin steelhead. The second most likely impact is catch and release of juveniles during trout fisheries or in fisheries that target other resident fish species under general fishing regulations. Although rare, there is a chance that steelhead are encountered in fisheries that target hatchery-origin chinook. Habitat impacts of fishing activities are also possible.

Catch-and-release fishing for adult steelhead: To evaluate the population effects of catch-and-release fishing on listed steelhead, it is necessary to calculate what proportion might be subject to encounters with anglers. The IDFG biologists have generated annual estimates of the harvest rate of Idaho-origin hatchery steelhead by recreational anglers licensed in Idaho. The number of fish destined for Idaho waters is calculated by adjusting the count of hatchery steelhead over Lower Granite Dam by the number of hatchery steelhead originating from hatcheries above Lower Granite Dam in Oregon and Washington. By dividing the adjusted count of hatchery steelhead over Lower Granite Dam into the IDFG Phone Survey estimate of harvest, biologists are able to compute a harvest rate for hatchery stocks. This method provides the best available estimate of the maximum encounter rate for listed stocks (IDFG 2002b).

To generate an estimate of the harvest rate of hatchery steelhead returning to Idaho by anglers licensed to fish in Idaho, the estimated number of hatchery steelhead crossing Lower Granite Dam that are returning to Oregon and Washington hatchery facilities in the Grande Ronde and Imnaha Rivers, including the harvest of these fish in Idaho, is subtracted from the total count of hatchery steelhead crossing Lower Granite Dam. Complete data are available for the annual returns of steelhead to Oregon and Washington hatcheries situated on tributaries of the Snake River above Lower Granite Dam for the years 1990 though 1996. Additional information is available for 1997 through 2001. The percent of the Lower Granite Dam Count of hatchery steelhead bound for Idaho ranged from 83.6 in 1996 to 91.5 in 1990 and averaged 87.4 (Table 3).

The estimated harvest rate of Idaho origin hatchery steelhead by recreational anglers licensed to fish in Idaho ranged from 0.35 in 1995 to 0.60 in 1993 and averaged 0.47 (Table 4). The estimated proportion of hatchery fish caught, that are kept by Idaho anglers averages 0.723. The estimated encounter rate of hatchery steelhead is the harvest rate (0.47) divided by the proportion caught that are kept (0.723) or 0.65.

If the encounter rate of hatchery steelhead is the same as the encounter rate of listed steelhead then 0.65 of the listed steelhead that enter Idaho are caught and released. If 5% of the listed steelhead that are incidentally caught and released subsequently die, then 3.25 percent of the wild steelhead entering Idaho each year are incidentally killed during the conduct of the recreational fishery that targets unlisted hatchery stocks.

Illegal harvest in recreational fisheries has not been identified as an important cause of the decline of listed species (August 18, 1997, 62 FR 43937). IDFG law enforcement officers patrol all open fishing waters and utilize check stations and undercover patrols in areas of high activity. Although illegal harvest does occur, and incidents of intentional or inadvertent illegal take of listed species are cited every year, the number of fish detected as illegal harvest is very small and is not expected to negatively impact the listed populations.

Table 3. The estimated number of Idaho origin hatchery steelhead entering Idaho for the years 1990 to 2001. (From IDFG 2002a)

Year	Hatchery Run Over Lower Granite Dam	Oregon Wallowa Run	Oregon Imnaha River	Washington Cottonwood Creek	Idaho Harvest of OR/WA Snake Stocks	Total Idaho Hatchery Return	% of Lower Granite Dam Counts bound for Idaho
1990	47,579	1,400	629	1,873	136	43,541	91.5
1991	81,731	6,937	1,428	1,777	395	71,194	87.1
1992	108,919	5,830	2,427	3,882	346	96,434	88.5
1993	52,414	3,953	173	2,188	288	45,812	87.4
1994	39,786	2,232	320	2,945	17	34,272	86.1
1995	71,135	3,976	626	4,087	259	62,187	87.4
1996	79,275	7,831	1,852	3,012	297	66,283	83.6
1997	77,879	NA	NA	NA	NA	* 68,066	* 87.4
1998	66,335	NA	NA	NA	NA	* 53,607	* 87.4
1999	62,846	NA	NA	NA	NA	* 54,927	* 87.4
2000	95,183	NA	NA	NA	NA	* 83,190	* 87.4
2001	220,303	NA	NA	NA	NA	*192,545	* 87.4
2002	179,100					*156,301	* 87.4
2003	135,281					*118,236	* 87.4

* Estimated based on the 1990 through 1996 average.

Table 4. The estimated harvest rate by recreational anglers licensed in Idaho on Idaho hatchery stocks for the years 1990 –2001 (from IDFG 2002a).

Year	Total Return To Idaho Hatcheries	Estimated Harvest (based on phone survey)	Idaho Harvest of OR/WA Hatchery Stocks	Harvest of Idaho Hatchery Stocks	Harvest Rate on Idaho Hatchery Stocks
1990	43,541	19,190	136	19,054	0.44
1991	71,194	28,572	395	28,177	0.40
1992	96,434	44,662	346	44,316	0.46
1993	45,812	27,704	288	27,416	0.60
1994	34,272	19,618	17	19,601	0.57
1995	62,187	22,105	259	21,846	0.35
1996	66,283	27,211	297	26,914	0.41
1997	68,066	35,935	NA	NA	0.53
1998	53,607	22,166	NA	NA	0.41
1999	54,927	28,218	NA	NA	0.51
2000	83,190	35,941	NA	NA	0.43
2001	192,545	103,286	NA	NA	0.54
2002	156,301	82,992	NA	NA	0.53
2003	118,236	NA	NA	NA	NA
	Average				0.47

The IDFG believes the estimated incidental mortality of 3.25% to be biased high and therefore a maximum. Of 4,500 miles of river and stream occupied by listed steelhead, 683 miles (approximately 15%) are open to harvest of steelhead. The open waters are located in the main stems of the largest rivers and downstream from fish hatcheries where unlisted, hatchery produced fish are known to return. The most important spawning streams for listed, naturally reproducing steelhead are closed to harvest and managed as refugia for listed fish. No fishing is allowed in the Middle Fork or South Fork of the Salmon River, or in the Salmon River tributaries that have been identified as important production areas. Only limited catch-and-release fishing is allowed in the Lochsa and Selway Rivers.

Although naturally produced listed steelhead are mixed with unlisted hatchery fish when migrating through the open fishing areas, they are protected from all fishing impacts when they arrive in the spawning streams. Anglers tend to concentrate in areas where high catch rates can be experienced. The most heavily fished areas for steelhead are the 40 miles of the Clearwater River immediately below Dworshak Hatchery, the 25 miles of the Little Salmon River that are the site of large hatchery releases, and the sections of the main Salmon River near the Little Salmon, near Pahsimeroi Hatchery, and downstream from Sawtooth hatchery. Particularly during the late winter and early spring period when intense fishing and harvest may occur on the hatchery returnees in these terminal areas, anglers are concentrated in a relatively small area and the proportion of listed fish in the catch is low. NMFS agrees that limiting fisheries to times and areas where unlisted hatchery fish are most common, and providing sanctuary areas that are

closed to fishing where wild fish predominate, serve to further reduce the encounter rate of listed fish in the fisheries.

NMFS agrees that the estimate of 3.25% catch-and-release mortality is likely higher than the actual rate because of the factors discussed above. However, until the IDFG refines the creel census process to better define this estimate, this rate will be used to estimate recreational fishery impacts.

Impacts during resident species fisheries
The accidental or incidental capture of an adult steelhead by an angler who is seeking resident species such as trout and bass is an unusual, but not impossible, occurrence. The general stream fishing season for trout is Memorial Day weekend through November. Nearly all adult steelhead have spawned and are not present in streams during trout seasons. During August through November, an angler must have a steelhead card and license and is bound by steelhead regulations if fishing for steelhead, so trout fishing impacts during the steelhead season would be included under the steelhead season impact analysis. NMFS proposes to authorize take represented by resident fisheries occurring until the point at which in-season monitoring indicates that 10 listed adult steelhead have been taken incidental to the conduct of resident species fisheries; this is the level of take at which, based on a conservative 10% catch-and-release mortality rate, an ESA-listed steelhead might be killed. This level of take is unlikely to occur, and would be distributed over several different steelhead populations. If such take did occur, it would not be expected to have a measurable effect on steelhead population viability, and so would not require closure of general fishing for resident species.

Although most rivers and streams that are occupied by juvenile steelhead in Idaho are open to trout fishing, angling regulations for trout are progressively more restrictive in more important production areas. River areas that are rarely occupied by juvenile steelhead are open under general fishing regulations, accessible production and rearing areas are covered by "Wild Trout" regulations with a 2-fish limit, and the most important natural production areas are restricted to catch-and-release fishing with artificial flies and lures with single, barbless hooks only. Many of the important steelhead production areas are streams within Federally designated Wilderness, where access is limited and fishing pressure is light. The steelhead encounter rates are expected to be less than 10% and the mortality rates are expected to be low. As discussed above in section 4.1.1, Catch and Release Mortality, per-capture mortality of trout and juvenile steelhead approaches zero when fishing regulations require single, barbless hooks and artificial lures.

In a separate action, NMFS is analyzing an FMEP submitted by IDFG for ESA section 4(d) coverage of recreational fisheries for resident species. In the FMEP, IDFG calculates that there are approximately 3,000,000 pre-smolt steelhead rearing in the Idaho portion of the Snake River basin in recent years (IDFG 2002c). Extrapolating from creel census data, IDFG biologists calculate that a maximum 10% of those presmolts may be subject to catch-and-release handling in the recreational fisheries discussed in the FMEP, and mortality could be 5% per capture. Multiplying this mortality by current survival rates, the impact of this level of fishing would be equivalent to 60 fewer adult steelhead annually returning to the Snake River (IDFG 2002c). The average count of adult wild steelhead reported at Lower Granite Dam, returning to the Snake

River averaged 9,968 for the four years including 1996 through 1999, and averaged 42,745 from 2000 through 2003 (FPC 2004). Recreational fishing on presmolts that reduces the run by 60 adult fish does not appear to be a substantial impact on the total population or on recent trends in population abundance. Because the impact is distributed across several thousand miles of rivers and streams that are occupied by a number of different steelhead populations, and the mortality is likely to be random, there is no measurable impact on the diversity or distribution of the ESU. Judging from the recent trend in abundance, the reduction of 60 adults would not be likely to affect population growth trends or productivity.

Impacts during spring chinook salmon fisheries
No incidental catch or harvest of listed adult steelhead has been reported in the annual reports of recreational spring chinook salmon fishing in recent years because steelhead and chinook runs do not occur in the same time periods. Steelhead fishing primarily takes place between September and March while chinook fishing occurs mostly in May through July.

Some steelhead may arrive in the fall migration before the salmon season closes. For the past ten years, 1.7% of the annual adult steelhead return has crossed Lower Granite Dam by August 1 (FPC 2004), and it is possible that some of the early migrants could arrive in waters open to salmon fishing prior to the salmon season closing (August 7). However, the fishery areas most likely to encounter an adult steelhead (lower main stem Snake River and Salmon River) are closed to chinook salmon fishing by the end of June and August 7, respectively. The proposed spring/summer chinook salmon recreational fisheries start in mid-to-late April when listed steelhead are expected to have passed through the areas open to salmon fishing and end no later than August 7, prior to the expected arrival of the fall run of listed Snake River Basin steelhead.

Some listed steelhead kelts (fish that have spawned) may occur in the areas open to salmon fishing early in the salmon season. Until April 30, unlisted, hatchery-produced steelhead kelts may be retained in possession by anglers who have the proper license and catch card, and these impacts are considered in the "Steelhead Fisheries" analysis. Unmarked, naturally produced kelts must be released. Very few steelhead kelts survive to repeat spawning in the Snake River basin. Prior to construction of the FCRPS dams less than 5% of steelhead spawners in Snake River tributaries were reported to be repeat spawners. Since the completion of the FCRPS, repeat spawners are observed so rarely that no records are kept (Steve Pettit, IDFG retired, personal communication). The occasional incidental handling of kelts in a salmon fishery would have little effect, if any, on the viability of the population or ESU.

Allowing salmon fishing in the Salmon River, the Hells Canyon reach of the Snake River, and the Idaho-Washington boundary water reach of the Snake River may slightly increase the possibility that a salmon angler will encounter a steelhead, but again, the likelihood is very small, and so the potential for adverse effects as a result of the encounters would be small. Steelhead kelts are reported passing downstream at Lower Granite Dam at the same time chinook are migrating upstream in May, and therefore must be present during the proposed chinook fisheries, however they are not reported in the catch. There is a possibility, however rare, that a steelhead kelt might be caught and released, but any additive affects are nullified by the essentially certain death of the kelt in the FCRPS dams and reservoirs.

Juvenile steelhead are not recruited to chinook salmon fisheries because the size of bait and lures and fishing techniques used for salmon are too large for steelhead juveniles.

4.2.4 Snake River Spring/Summer Chinook Salmon

Of the recreational fisheries proposed to be implemented by IDFG in the Snake River basin, only the fisheries that target hatchery-origin chinook salmon that are in excess of conservation needs are likely to impact survival and recovery of Snake River spring/summer chinook salmon. The fisheries that target hatchery-origin adult steelhead are conducted from September through April and there is a very short period of overlap with chinook fisheries in the month of April. The earliest chinook fishery opens in mid-April, when chinook salmon first enter the lower reaches of the main-stem rivers. At that time, nearly all steelhead have migrated and are spawning far upstream in tributaries or upper reaches of the main stem. The time and area separation of the two fisheries effectively eliminates overlap. Trout fisheries primarily occur in tributaries while chinook salmon fisheries primarily occur in the main stem of larger rivers. There is almost complete overlap of open seasons, but fishermen fishing for, or catching, chinook salmon must possess the proper licenses and permits and are considered in the impact of the chinook fishery. It is illegal to capture or harass chinook salmon except as allowed in the chinook fishing regulations.

The proposed spring/summer chinook recreational fisheries are generally conservative and designed to avoid interception of naturally produced fish. For example, only about 10% of the river miles occupied by salmon are proposed to be open to fishing, and the open areas are restricted to the times and places where hatchery-produced fish are expected to be most abundant, such as the terminal areas near hatchery weirs. Harvest is restricted to hatchery-produced fish that are marked by an excised adipose fin and healed scar, and fishing tackle is restricted to barbless hooks to reduce injuries and facilitate release of listed fish that may be hooked. Fisheries are designed to avoid the encounter of listed chinook and population mortality, at a 10% per capture rate, is expected to be small. The incidental mortality of naturally produced fish associated with harvest of hatchery stocks is constrained by an abundance-based sliding scale which allows no incidental harvest impacts if fewer than 4,000 adult natural-origin spring/summer chinook salmon cross Lower Granite Dam. The allowable impact rate increases in small increments until it reaches 2.0% at abundance exceeding interim recovery targets.

Juvenile spring/summer chinook salmon are not often encountered in trout fisheries because they are generally too small to be recruited to the fishing gear used for trout, and the largest juvenile chinook are smolts which emigrate during the spring freshet, prior to the trout season. Juvenile chinook salmon are protected by the same requirements for restricted fishing gear, seasons, and limits that are designed to protect juvenile steelhead and native trout species. A small amount of incidental take is likely in spite of the protective regulations. The IDFG estimates that 500 juvenile chinook salmon may be caught-and-released by anglers seeking trout and up to 50 may die as a result. At the current parr-to-smolt survival rate of around 0.5, and the smolt-to-adult survival rate of 0.01, the death of 50 juvenile chinook in recreational fisheries could reduce the return of adults by 0.25 adults annually – or one fewer adult every four years.

The incidental mortality of naturally produced fish associated with harvest of hatchery stocks is designed to be more restrictive at smaller run sizes and would be allowed to increase gradually as the run approaches or exceeds the interim recovery goal. The harvest sliding scale, described in detail in section 2.2.1, allows no incidental harvest impacts if fewer than 4,000 adult natural-origin spring/summer chinook salmon cross Lower Granite Dam. The allowable impact rate increases in small increments until it reaches 2.0% at abundance exceeding interim recovery targets. The sliding scale applies to the total annual count of natural-origin Snake River spring/summer chinook salmon ESU at Lower Granite Dam. NMFS would also analyze the IDFG's annual proposed fishery to ensure that individual components of the ESU are not subject to a greater incidental harvest impact than the percentage specified in the sliding scale. As an example, a preseason forecast of 17,600 spring/summer chinook salmon would allow an incidental mortality of 0.75%. In its annual review and analysis of the proposed fishery, NMFS would assess whether incidental mortality of Salmon River natural-origin adults would exceed 0.75% of the naturally produced portion of the return. This will ensure that individual components of the ESU are not subjected to substantially greater impact than the percentage specified in the sliding scale. Some fisheries at the lowest end of the sliding scale could occur as long as impacts are limited to specific terminal areas. Examples of these types of fisheries occur in the Clearwater River (where no take of listed fish would be expected), in the Hells Canyon reach of the Snake River where no natural-origin chinook are expected, and in the Little Salmon/Rapid River where impacts on non-target fish are expected to be limited by fishing conditions and regulations.

The following sections address the likely impacts in each of the proposed fishing areas for spring chinook salmon in sections of four rivers: Clearwater River, Little Salmon River, Salmon River, and Snake River.

4.2.4.1 Clearwater River

Spring chinook in the Clearwater River are not considered part of the Snake River ESU and therefore they are not listed. However, the proposed fishery targets only adipose-clipped, hatchery-produced chinook salmon to protect the natural-spawning component of the reintroduced population and to eliminate the possibility that a listed stray might be taken. Fisheries conducted annually between 1997 and 2003 have been assessed and found to have no effect on listed Snake River spring/summer chinook salmon (NMFS 2000a). Future fisheries in the Clearwater Basin will be conducted within a time and location framework similar to the previously authorized fisheries with annual adjustments to regulations based on predicted returns and requirements for hatchery broodstock and desired natural spawning escapement. Monitoring of previous fisheries in the Clearwater basin has detected no take of listed spring/summer chinook salmon (IDFG 2002b, 2004). As a result, NMFS concludes that the proposed future fisheries in this basin will have no effect on listed spring/summer chinook salmon.

4.2.4.2 Little Salmon River

The Little Salmon River fishery targets unlisted, marked, hatchery-produced adults that are returning to Rapid River Hatchery, located on a tributary of the Little Salmon, as well as smolt releases of Rapid River stock that are made in upstream portions of the Little Salmon River. Annual predictions of hatchery returns are made based on sibling expansion methods and PIT tag

detections. The run forecasts are compared to numbers of fish needed for hatchery broodstock to determine surplus available for harvest. Potential catch rates are used to calculate impacts on listed spring/summer chinook salmon that may result from incidental catch and release mortality.

Analysis of fishery impacts assumes that hatchery-origin fish returning to Rapid River Hatchery and natural-origin fish returning to Rapid River and upstream tributaries are equally and proportionally mixed in the fishing area and all are equally susceptible to the fishery. The IDFG reports that, on average, 82% of the unlisted fish caught are harvested and 18% are released. In other words, the harvest rate is 0.82 of the catch rate. So, if 0.23 of the hatchery fish are harvested, 0.28 were caught (0.23/0.82 = 0.28). If 0.28 of the hatchery-origin fish were caught, the analysis assumes that 0.28 of the natural-origin fish were also caught and released. If 28% of the natural-origin fish are caught and released, and incidental mortality is 0.10 per capture, then mortality would be calculated as 0.028 (2.8%) of the number of listed fish returning to that area. This analysis is actually conservative, in that in-season monitoring of fisheries has indicated that natural-origin fish are notably under-represented in the actual catch, possibly because the hatchery-origin fish tend to accumulate downstream from release points while natural-origin fish tend to pass through the sections open to fishing and enter sanctuary aras (IDFG 2003).

4.2.4.3 Salmon River

Fishing in the lower mainstem of the Salmon River primarily targets hatchery-origin chinook that are destined for Rapid River Hatchery, which are likely to be the most abundant non-listed stock present in any given year. There are several other hatchery stocks that pass through this section during the fishery, including spring/summer chinook salmon that are destined for the South Fork Salmon River, Pahsimeroi, and Sawtooth hatcheries. There are also likely to be several listed stocks of Snake River spring/summer chinook salmon passing through the fishing area during the open fishing season. Calculation of impacts from this fishery will vary annually based on annual abundance forecasts for each component of the run, as well as on knowledge about differential run timing and distribution.

The fishery location and open season dates are selected to minimize interception of listed fish and reduce the risk of fishery impacts. Monitoring and evaluation is intended to check the validity of these assumptions and allow adaptive management of the fisheries. Between the season opening and early June, most of the fish encountered are expected to be early spring run fish destined for Rapid River – this would include a small proportion listed natural-origin fish. After mid-June, summer-run chinook salmon destined for the South Fork Salmon River, Pahsimeroi River, and upper Salmon River may be encountered. Listed stocks that could be exposed to mortality in the fishery would be primarily spring chinook salmon destined for the Middle Fork Salmon River, Salmon River canyon tributaries, Lemhi River, East Fork Salmon River, Yankee Fork, and portions of the upper Salmon River, including hatchery fish returning to Sawtooth Hatchery. The allowable incidental take of the listed stocks would follow the abundance-based sliding scale, as detailed in section 2.2.1, which ranges from no impact at run sizes below 4,000 fish and reaches 2% if the count of natural-origin spring/summer chinook at Lower Granite Dam exceeds 35,600. Impacts would be distributed randomly among the stocks that enter the fishing area during the open time period and no stock is expected to be disproportionately impacted.

Fishery Monitoring and Enforcement

The fishery will be monitored for legal and illegal harvest and incidental catch and release of both marked and unmarked chinook salmon. Standards will be sufficient to meet permit requirements and will be similar to monitoring for previous chinook salmon recreational fisheries. The IDFG staff will utilize a combination of roving creel census, random creel census from enforcement checks, mandatory catch cards, and check stations to provide the most effective monitoring of angler participation and harvest composition in the fishery. The arrival timing of PIT tagged natural adult chinook salmon at Lower Granite Dam prior to and during the fishery period will be tracked. This information will be provided to NMFS as it becomes available, within the fishing season, to help cross-check IDFG assumptions regarding natural fish timing and interception.

4.2.4.4 Snake River

Upstream of the Imnaha River

Impacts

Few naturally produced spring/summer chinook salmon are expected to be encountered during the fishery. It is likely that any unmarked fish is either a stray from some other area, an unmarked or mis-marked hatchery fish or the progeny of hatchery fish that have spawned naturally in the limited available area. Because there is little evidence with current low run sizes that spring chinook salmon production is occurring in this area, any ESA-listed adult fish that are taken incidentally in this fishery will likely be strays from other areas of the Snake River basin. The IDFG projects that the fishery would result in the catch and release of no more than 10 listed adult spring chinook with incidental mortality of 1 listed adult chinook salmon.

The opportunity for chinook anglers to intercept listed, wild steelhead is minimal because wild steelhead of the previous run year will have ascended tributaries prior to opening of the chinook fishery and the chinook fishery will close prior to arrival of steelhead in the following year's run.

NMFS agrees that few listed fish are likely to occur in this river reach during the proposed fishery dates and concurs with the IDFG estimates.

Fishery Monitoring and Enforcement

The IDFG staff is developing methods and logistics in concert with ODFW for effective monitoring of this fishery. This reach of the Snake River is located in Hells Canyon. Access is limited by rugged terrain, the remoteness of the area and restrictions of motor vehicles promulgated by Hells Canyon National Recreation Area. There are only three access points that may be reached by vehicles and much of the access to the canyon occurs by jet boats. The states plan to use a voluntary creel survey at key access points, random creel checks by the IDFG and Oregon State Police wildlife law enforcement officers patrolling the river reach by boat, saturation patrols at access points, and catch-card reports to estimate harvest and participation in this fishery.

Snake River - Idaho/Washington Boundary water

Impacts
Similar to the mainstem Salmon River fishery, a large number of stocks, both listed and unlisted, are expected to pass through this river reach during the fishery period. Calculation of impacts of this fishery will vary annually based on annual abundance forecasts for each component of the run, as well as knowledge about differential run timing and distribution. The fishery location and open season dates are selected to minimize interception of listed fish and reduce the risk of fishery impacts. Monitoring and evaluation is intended to check the validity of these assumptions and allow adaptive management of the fisheries. The IDFG has presented data on PIT tags crossing Lower Granite Dam that indicates that unlisted hatchery-produced fish arrive in the fishery area well before the listed, natural fish. As a result, the proposed fishery would close no later than the end of June, to target the early returning hatchery fish and protect listed fish. During the season, the IDFG must maintain continual monitoring of the proportion of unlisted fish estimated at the dam and in the fishery. If at any time the PIT tag detections, fish counting observations, or fishery monitoring indicates that the number of listed fish in the fishery area will equal or exceed the number of unlisted salmon, the IDFG must close the fishery.

Fishery Monitoring and Enforcement
The IDFG and the WDFW will jointly conduct creel census and law enforcement activities. Weekly harvest estimates will be tabulated, composition of the catch will be examined, any pertinent run count or timing data will be reviewed and a decision will be made as to whether the fishery will continue. Monitoring triggers that could stimulate adjustment or closure of the fishery include the proportion of natural fish caught and released, the number of PIT tag detections at Lower Granite Dam that are destined for the Imnaha River, Grande Ronde River, or other listed programs, and any other monitoring data that indicates fishery impacts are greater than anticipated.

4.2.4.5 Combined Impacts of Proposed Chinook Fisheries

Combined impacts of all fisheries on spring chinook are to be managed within the limits of the sliding scale laid out in Table 1. These mortality levels are not expected to substantially effect the four VSP parameters (abundance, population growth rate, spatial structure, and diversity). The incidental take of a small number of fish, regulated by this process that is sensitive to annual population abundance, will not substantially reduce the abundance of listed chinook in the Snake River basin. Similarly, population growth rate will not be measurably affected by the removal of a small percentage of the potential spawning population. Proposed fisheries occur primarily in lower mainstem areas and are not expected to differentially impact any single population. Natural populations will also be rapidly migrating through the proposed fishery areas and will have limited susceptibility to being caught. For these reasons, the incidental take will be distributed among a number of populations and is not likely to have any impact on the spatial distribution or genetic diversity of the return.

The IDFG has described an extensive monitoring plan for assessing the catch, effort, and composition in the Snake River basin fishery in the conservation plan (IDFG 2004). Specific commitments described in this plan are incorporated into the evaluation of the fisheries assessed

in this biological opinion. The IDFG will use information gathered through this fishery monitoring to modify or close fisheries as necessary to limit mortalities and other fishery impacts to the listed natural- and hatchery-produced chinook salmon that may be affected by the proposed fisheries consistent with the maximum harvest constraint determined in annual approvals.

4.3 Effects on Critical Habitat

The circumstances surrounding the designation of critical habitat for Snake River spring/summer chinook and fall chinook salmon and Snake River Basin steelhead (and the subsequent vacating of critical habitat designation for the latter) were described above. A description of the essential features of that habitat and a depiction of its present condition were also given. The discussion here addresses how those features of critical habitat for these ESUs are likely to be affected by the proposed actions.

This analysis does not rely on the regulatory definition of "adverse modification or destruction" of critical habitat recently invalidated by the 9th Circuit Court of Appeals (*Gifford Pinchot Task Force, et al., v. U.S. Fish and Wildlife Service*, No. 03-35279, August 6, 2004). Instead, this analysis focuses on statutory provisions of the ESA, including those in Section 3 that define "critical habitat" and "conservation," in Section 4 that describe the designation process, and in Section 7 setting forth the substantive protections and procedural aspects of consultation.

Full descriptions of the proposed activities and the area in which those activities would occur are given above and in the application. The proposed action is likely to have direct effects on adult migration conditions (through interception of adult fish as they are migrating) and indirect effects on substrate (due to wading), riparian vegetation, and juvenile migration conditions (due to presence of fishers on the banks and in or on the water). All of these effects, however, are expected to be small in magnitude and transitory in time frame, and therefore are not likely to reduce the capacity of those features to meet the conservation needs of the affected ESUs. Harvest activities do affect critical habitat in that harvest activities interfere with adult migratory passage through fish interception, but those impacts are accounted for explicitly in the above analysis. None of the other essential habitat features or PCEs listed earlier (i.e., stream substrates, water quality, water quantity, etc.) will be measurably affected. An incremental change in the conservation value of critical habitat within the action area due to the proposed action cannot be quantified. However, based on the effects described here, and the analysis of those effects given in the analysis above, it is reasonably likely that the proposed action will have no more than a small, local, and short-term neutral effect on the conservation value of the designated critical habitat affected, and will not result in the adverse modification or destruction of proposed critical habitat.

4.4 Cumulative Effects

Cumulative effects are those effects of future Tribal, state, local or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation. For the purpose of this analysis, the action area is that part of the Snake River basin described in the *Description of the Proposed Action* section above.

Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities will be reviewed through separate section 7 consultation processes. Non-Federal actions that require authorization under section 10 of the ESA, and that are not included within the scope of this consultation, will be evaluated in separate section 7 consultations.

Future Tribal, state, and local government actions will likely be in the form of legislation, administrative rules, or policy initiatives. Government and private actions may include changes in land and water uses, including ownership and intensity, any of which could impact ESA-listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties. These realities, added to the geographic scope of the action area which encompasses numerous government entities exercising various authorities and the many private landholdings, make any analysis of cumulative effects difficult and frankly speculative. This section identifies representative actions that, based on currently available information, are reasonably certain to occur. It also identifies some goals, objectives and proposed plans by government entities, however, NMFS is unable to determine at this point in time whether any proposals will in fact result in specific actions.

State Actions

Each state in the Snake and Columbia River basins administers the allocation of water resources within its borders. Most streams in the basin are over appropriated even though water resource development has slowed in recent years. Washington closed the mainstem Columbia River to new water withdrawals, and is funding a program to lease or buy water rights. If carried out over the long term this might improve water quantity. The state governments are cooperating with each other and other governments to increase environmental protections, including better habitat restoration, hatchery, and harvest reforms. NMFS also cooperates with the state water resource management agencies in assessing water resource needs in the Snake River basin, and in developing flow requirements that will benefit ESA-listed fish. During years of low water, however, there could be insufficient flow to meet the needs of the fish. These government efforts could be discontinued or even reduced, so their cumulative effects on ESA-listed fish is unpredictable.

The state of Washington has various strategies and programs designed to improve the habitat of ESA-listed species and assist in recovery planning, including the Salmon Recovery Planning Act, a framework for developing watershed restoration projects. The state is developing a water quality improvement scheme through the development of Total Maximum Daily Loads. As with the Oregon initiatives, these programs could benefit the ESA-listed species if implemented and sustained. The state of Idaho is involved with numerous efforts to enhance the survival and recovery of ESA-listed Snake River salmon and steelhead including an aggressive irrigation diversion screening program, conservation hatchery programs, habitat enhancement activities, and watershed planning efforts.

In the past, each state's economy was heavily dependent on natural resources, with intense resource extraction activity. Changes in the states' economies have occurred in the last decade

and are likely to continue with less large scale resource extraction, more targeted extraction methods, and substantial growth in other economic sectors. Growth in new businesses is creating urbanization pressures with increased demands for buildable land, electricity, water supplies, waste disposal sites, and other infrastructure. Economic diversification has contributed to population growth and movement in the states, a trend likely to continue for the next few decades. Such population trends will place greater demands in the action area for electricity, water, and buildable land; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure development. The impacts associated with economic and population demands will affect habitat features, such as water quality and quantity, which are important to the survival and recovery of the ESA-listed species. The overall effect is likely to be negative, unless carefully planned for and mitigated.

Some of the state programs described above are designed to address these impacts. Also, Washington enacted a Growth Management Act to help communities plan for growth and address growth impacts on the natural environment. If the programs continue, they may help lessen some of the potential adverse effects identified above.

Local Actions

Local governments will be faced with similar but more direct pressures from population growth and movement. There will be demands for intensified development in rural areas as well as increased demands for water, municipal infrastructure, and other resources. The reaction of local governments to such pressures is difficult to assess at this time without certainty in policy and funding. In the past, local governments in the action area generally accommodated additional growth in ways that adversely affected ESA-listed fish habitat. Also, there is little consistency among local governments in dealing with land use and environmental issues so that any positive effects from local government actions on ESA-listed species and their habitat are likely to be scattered throughout the action area.

Tribal Actions

Tribal governments will continue to participate in cooperative efforts involving watershed and basin planning designed to improve fish habitat. The results from changes in tribal forest and agriculture practices, in water resource allocations, and in changes to land uses are difficult to assess for the same reasons discussed under state and local actions. The earlier discussions related to growth impacts apply also to tribal government actions. Tribal governments will need to apply comprehensive and beneficial natural resource programs to areas under their jurisdiction to produce measurable positive effects for ESA-listed species and their habitat.

Private Actions

The effects of private actions are the most uncertain. Private landowners may convert current use of their lands, or they may intensify or diminish current uses. Individual landowners may voluntarily initiate actions to improve environmental conditions, or they may abandon or resist any improvement efforts. Their actions may be compelled by new laws, or may result from growth and economic pressures. Changes in ownership patterns will have unknown impacts.

Whether any of these private actions will occur is highly unpredictable, and the effects even more so.

Recreational Fisheries Effects

The proposed Idaho recreational fishery activities in the Snake River basin are designed with a mandate for sustainable resource use under both Federal and State law and policy. Fisheries that impact listed salmon and steelhead within the action area are managed based on the impact to listed fish that are returning to the Snake River. Because the allowable impacts on listed species follow an abundance-based sliding scale, or maximum allowable incidental impact rate, if other conservation measures are unsuccessful in returning fish to the area, fishery impacts would be constrained. The sliding scale has the effect of measuring the cumulative success of all other efforts to restore salmon populations and to provide numbers of fish in excess of conservation needs. If the cumulative effects of other fisheries or conservation efforts do not allow sufficient escapement of returning adult salmon and steelhead to the Snake River to meet conservation needs plus support a fishery, recreational fishing would be constrained or closed.

If the cumulative effects of salmon management efforts fail to provide harvestable fish, then impacts due to recreational fishing in the Snake River would not be allowed. Therefore, the additive impact of the proposed action are expected to be minor, because of reporting and monitoring requirements that would ensure compatibility with other conservation strategies. Within the action area, there are expected to be beneficial effects on the biological and human environments associated with the application of scientific fishery management to provide for sustainable benefits from recreational fishing. Conservative management of recreational fishing is only one element of a large suite of regulations and environmental factors that may influence the overall health of listed salmon populations and their habitat. The recreational fishing program is coordinated with monitoring and adaptive management measures so that fishery managers can respond to changes in the status of affected listed salmon. Monitoring and adaptive management would help ensure that the affected ESUs are adequately protected and would help counter-balance any potential adverse cumulative impacts.

Summary

Non-federal actions are likely to continue affecting the ESA-listed species. The cumulative effects in the action area are difficult to analyze considering the geographic landscape of this consultation, the political variation in the action area, the uncertainties associated with government and private actions, and the changing economies of the region. Whether these effects will increase or decrease is a matter of speculation; however, based on the trends identified in this section, the adverse cumulative effects are likely to increase. Although state, tribal, and local governments have developed plans and initiatives to benefit ESA-listed fish, they must be applied and sustained in a comprehensive way before NMFS can consider them "reasonably certain to occur" in its analysis of cumulative effects.

4.5 Integration and Synthesis of Effects

Snake River Sockeye Salmon – The recreational fisheries proposed to be implemented in the Snake River basin by IDFG are not expected to appreciably reduce the likelihood of survival and recovery of Snake River sockeye salmon. Sockeye salmon adults typically return to the Snake River basin in July and August, and therefore are not subject to capture or harassment in steelhead fisheries which occur primarily in September through April. Although sockeye salmon adults and juveniles may be present in open river reaches during the season for trout and other resident species, sockeye salmon juveniles are only present for a very short time as they migrate, and are too small to be caught on the types of fishing tackle used for trout or chinook salmon. Analysis of recreational fisheries for resident species in nursery lakes where sockeye occur has not detected juvenile or adult anadromous sockeye in the catch. The Snake River chinook salmon fishery will close at the end of June, and the Salmon River chinook fishery will close by mid-July, prior to the time most sockeye salmon adults would be expected to pass into the open areas. Sockeye adults are not commonly caught in the tributary areas and none have been reported in Idaho fisheries since the 1970s.

Snake River Fall Chinook Salmon – The recreational fisheries proposed to be implemented by IDFG in the Snake River basin are not expected to appreciably reduce the likelihood of survival and recovery of Snake River fall chinook salmon. The proposed spring/summer chinook recreational fisheries are not expected to encounter Snake River fall chinook salmon because the fisheries end no later than August 7, prior to the expected arrival of listed Snake River fall chinook salmon. Fall chinook salmon only occur in the main stems of the Snake River and the lower reaches of the major tributaries, primarily in September and November. This provides a time and space separation from trout fisheries and most other resident-species fisheries that could impact fall chinook salmon. The only fishery expected to encounter a detectable number of fall chinook is the fishery that targets hatchery-origin steelhead, which is estimated to encounter 1.5% of the fall chinook run and cause mortality equal to 0.15% of the portion of the population that escapes upstream from Lower Granite Dam.

Snake River Spring/Summer Chinook Salmon – The recreational fisheries proposed to be implemented by IDFG in the Snake River basin are not expected to appreciably reduce the likelihood of survival and recovery of Snake River spring/summer chinook salmon. The fisheries that target hatchery-origin adult steelhead are conducted from September through April and there is a very short period of overlap in the month of April. The earliest chinook fishery opens in mid-April, when chinook first enter the lower reaches of the main-stem rivers. At that time, nearly all steelhead have migrated and are spawning far upstream in tributaries or upper reaches of the main stem. The time and area separation of the two fisheries effectively eliminates impact on spring/summer chinook salmon. Trout fisheries primarily occur in tributaries while chinook salmon fisheries primarily occur in the main stem of larger rivers. There is almost complete overlap of open seasons, but fishermen fishing for, or catching, chinook salmon must possess the proper licenses and permits and their impacts are considered in the impact of the

chinook fishery. It is illegal to capture or harass chinook salmon except as allowed in the chinook fishing regulations.

The only detectable impact on listed Snake River spring/summer chinook salmon is likely to occur in fisheries that target hatchery-origin adult spring/summer chinook that are excess to conservation needs. The proposed spring/summer chinook recreational fisheries are generally conservative and designed to avoid interception of naturally produced fish. For example, only about 10% of the river miles occupied by salmon are proposed to be open to fishing, and the open areas are restricted to the times and places where hatchery-produced fish are expected to be most abundant, such as the terminal areas near hatchery weirs. Harvest is restricted to hatchery-produced fish that are marked by an excised adipose fin and healed scar, and fishing tackle is restricted to barbless hooks to reduce injuries and facilitate release of listed fish that may be hooked. Fisheries are designed to avoid the encounter of listed chinook and population mortality, at a 10% per capture rate, is expected to be small. The incidental mortality of naturally produced fish associated with harvest of hatchery stocks is constrained by an abundance-based sliding scale that allows no incidental harvest impacts if fewer than 4,000 adult natural-origin spring/summer chinook salmon cross Lower Granite Dam. The allowable impact rate increases in small increments until it reaches 2.0% at abundance exceeding interim recovery targets.

Juvenile spring/summer chinook salmon are not often encountered in trout fisheries because they are generally too small to be recruited to the fishing gear used for trout, and the largest juvenile chinook are smolts which emigrate during the spring freshet prior to the trout season. Juvenile chinook are protected by the same requirements for restricted fishing gear, seasons and limits that are designed to protect juvenile steelhead and native trout species. A small amount of incidental take is likely in spite of the protective regulations. The IDFG estimates that 500 juvenile chinook may be caught-and-released by anglers seeking trout and up to 50 may die as a result.

Snake River Steelhead - Snake River steelhead listed under the ESA may be affected by the proposed fisheries in several ways and at several different life stages. The primary impact is catch and release of listed, adult, natural-origin steelhead incidental to fisheries targeting non-listed, hatchery-origin steelhead. Catch-and-release fishing for steelhead has been studied in the Pacific Northwest and Canada and is judged to be a valid strategy for reducing angling-related mortality. Catch-and-release fishing, combined with fishing gear restrictions, sanctuary areas and time and area closures, allows harvest of hatchery-origin steelhead in recreational fisheries while limiting the impact on listed, natural-origin fish. The IDFG provided analysis that 3.2% of the adult, listed, natural-origin steelhead returning to the Snake River could be taken incidental to the fishery that targets hatchery-origin fish as a worse-case scenario.

The second most likely impact is catch and release of juveniles during trout fisheries or in fisheries that target other resident fish species under general fishing regulations. The number of juvenile steelhead that might be encountered in fisheries that target trout and other resident species is fairly large, because this life stage is numerous, but the population impact is estimated to be no more than 0.5%. Although rare, there is a chance that steelhead are encountered in

fisheries that target hatchery-origin chinook. Habitat impacts of fishing activities are also possible.

5.0 CONCLUSION

Based on the status, environmental baseline, and consideration of its analysis:

Snake River Sockeye Salmon
NMFS concludes that the proposed issuance of permit 1481 will not jeopardize listed Snake River sockeye salmon nor result in the destruction or adverse modification of critical habitat.

Snake River Fall Chinook Salmon
NMFS concludes that the proposed issuance of permit 1481 will not jeopardize listed Snake River fall chinook salmon nor result in the destruction or adverse modification of critical habitat.

Snake River Steelhead
NMFS concludes that the proposed issuance of permit 1481 may affect, but will not jeopardize the continued existence of listed Snake River steelhead. NMFS has determined that the incidental mortality rate of 3.2% of the adult, naturally produced steelhead due to catch-and-release during fisheries that target unlisted, hatchery-produced steelhead will not appreciably reduce the long-term survival and recovery of listed Snake River Basin steelhead in the wild. Further, based on the same analysis, NMFS concludes that the proposed action is not likely to destroy or adversely modify proposed critical habitat.

Snake River Spring/Summer Chinook Salmon
NMFS concludes that the proposed issuance of permit 1481 may affect but will not jeopardize the continued existence of listed Snake River spring/summer chinook salmon nor result in the destruction or adverse modification of critical habitat. NMFS has determined that the level of incidental harvest-related mortality in the sliding scale summarized in Table 1 will not appreciably reduce the long-term survival and recovery of listed Snake River spring/summer chinook in the wild.

NMFS' conclusions are based on: (1) the low incidental mortality of listed fish as a result of catch-and-release in the proposed fisheries; (2) the finding that the mortality of listed fish will not appreciably reduce the abundance, long-term population growth rate, spatial distribution, and genetic diversity of listed populations; (3) the large proportion of unlisted hatchery fish in the fishery areas, which will be selectively targeted by the fishery; and (4) coordination of the annual IDFG fishery proposals within a review that addresses the other state and Tribal fisheries within the Snake River basin that are proposed to occur each year. Annual review and approval by NMFS of the recreational fisheries managed by the IDFG will help assure that the long-term aggregate impacts of recreational fisheries do not reduce the likelihood of survival and recovery of these populations.

6.0 INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibits the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

6.1 Amount or Extent of Take Anticipated

The proposed permit is for activities to be conducted over approximately a five-year period. Take numbers listed below are the maximum numbers authorized annually from 2004 through 2009, unless otherwise indicated.

6.2 Effect of the Take

NMFS determined that the level of incidental take relative to recreational fisheries managed by the IDFG is not likely to jeopardize the continued existence of listed salmonid species or result in the destruction or adverse modification of habitat designated as critical, or proposed for such designation, when the prescribed terms and conditions are followed. The actual number of listed fish of each ESU taken will vary annually, dependent upon harvest levels that will be based on run sizes, so no specific number for take can be provided here. However, the fisheries are designed to explicitly avoid reducing the likelihood of survival and recovery of the listed species, and nearly all fishery benefits derived from the proposed action will come as a result of harvest of non-listed fish.

The proposed permit authorizes incidental take of listed salmonid species in resident species, hatchery-origin steelhead, and anadromous salmon fisheries. The proposed permit does provide for annual adjustments of incidental take limits for anadromous spring/summer chinook salmon, following an abundance-based sliding scale based on the predicted annual returns of the natural-origin component of listed Snake River spring/summer chinook and changes in population status. Analysis of the effects of the proposed permit results in a finding that the annual take levels that would be authorized under the new permit do not jeopardize the continued existence of listed salmonid species.

6.3 Reasonable and Prudent Measures

NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimizing take of Columbia River Basin salmonids listed or proposed for listing. In general, NMFS shall:

- Require that IDFG minimize adverse effects on listed Snake River spring/summer and fall chinook salmon, sockeye salmon, and steelhead in state-managed salmon and steelhead fisheries by requiring live release of all non-target fish and application of the abundance-based sliding scale to spring and summer chinook salmon fisheries, as described in the application (see Section 2).

- Participate with the IDFG in evaluating run sizes and fishery performance on an annual and in-season basis, including requiring that IDFG implement its proposed monitoring, evaluation, and reporting activities.

6.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the action agency must comply with terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary with respect to species listed under the ESA and are valid for the duration of the permit:

NMFS shall include, in the permit it issues to IDFG, the following conditions:

General Fishing Regulations

1. Mainstem Rivers and Tributary Streams:
   a. The incidental harvest of up to 10 adult threatened, Snake River spring/summer chinook salmon and the incidental catch and release of up to 60 adult, threatened, Snake River spring/summer chinook salmon, of which 6 may die, is authorized;
   b. The incidental catch and release of up to 500 juvenile, threatened, Snake River spring/summer chinook salmon, of which 50 may die, is authorized;
   c. The incidental catch and release of up to 10 adult, threatened, Snake River fall chinook salmon, of which 1 may die, is authorized.

2. The incidental catch-and-release of juvenile, threatened, Snake River Basin steelhead is authorized by a separate Fisheries Management and Evaluation Plan and, therefore, not authorized in this permit.

3. The incidental catch and release of up to 10 adult, threatened, Snake River Basin steelhead, of which 1 may die, is authorized.

4. Redfish, Alturas, and Pettit Lakes:
   a. Up to 34 residual adult and/or juvenile, endangered, naturally-produced (unmarked), Snake River sockeye salmon may be harvested incidental to a kokanee fishery at Redfish, Alturas, and/or Pettit Lakes;
   b. Up to 30 juvenile, endangered, hatchery-produced (marked), Snake River sockeye salmon may be harvested incidental to a resident trout fishery at Redfish, Alturas, and/or Pettit Lakes.

Anadromous Salmon Fishing Regulations.

The maximum number of listed ***adult*** fish that may be encountered, and that may subsequently die during implementation of the Anadromous Salmon Fishing Regulations, is limited within an abundance-based sliding scale as follows:

5. When fewer than 4,000 adult naturally produced spring/summer chinook salmon are predicted to migrate over Lower Granite Dam, and the predicted number of unlisted hatchery-origin spring chinook returning to the Rapid River Hatchery is more than that required to meet broodstock goals, the Department may conduct a recreational fishery targeting this stock in the Little Salmon River. When the run size is less than 4,000, no more than 80 adult, listed, naturally produced Snake River spring/summer chinook salmon will be allowed to be caught and released in the Little Salmon River, of which up to 8 might die, incidental to the harvest of unlisted artificially-propagated (adipose fin-clipped), spring/summer chinook salmon.

6. When more than 4,000 naturally produced spring/summer chinook salmon are predicted to migrate over Lower Granite Dam, and the predicted number of unlisted hatchery-origin spring/summer chinook is more than that required to meet broodstock goals, the Department may conduct a recreational fishery on the Snake River, Salmon River, and/or the Little Salmon River. To facilitate flexibility in crafting the specific locations and dates to harvest unlisted surplus hatchery production, the IDFG will consult with NMFS to review the predicted return of unlisted, hatchery-produced, adult salmon as well as the predicted return of ESA-listed hatchery and naturally-produced adult salmon, the proposed fishing regulations, and incidental take quotas.

7. Overall incidental mortality of threatened Snake River spring/summer chinook salmon in fisheries authorized by this permit will not exceed the numbers provided by a sliding scale based on the number of adult spring/summer chinook projected to pass Lower Granite Dam as follows: (1) no incidental take will be allowed, except for limited terminal areas, when fewer than 4,000 natural-origin spring/summer chinook cross Lower Granite Dam, (2) the total incidental mortality of listed Snake River spring summer chinook salmon in recreational fisheries shall be no more than 0.25 % of the total run when between 4,000 and

6,400 natural-origin spring/summer chinook pass Lower Granite Dam, (3) the incidental mortality shall not exceed 0.5% of total run when between 6,400 and 14,250 natural-origin spring/summer chinook pass Lower Granite Dam; (4) the incidental mortality shall not exceed 0.75% of the total run when between 14,250 and 21,400 natural-origin spring/summer chinook pass Lower Granite Dam; (5) the incidental take shall not exceed 1.0% of the total run when between 21,400 and 28,500 natural-origin spring/summer chinook pass Lower Granite Dam; (6) the incidental take shall not exceed 1.5% of the total run when between 28,500 and 35,600 natural-origin spring/summer chinook pass Lower Granite Dam; and (7) the incidental mortality shall not exceed 2.0% when the total run is in excess of 35,600 natural-origin spring/summer chinook past Lower Granite Dam. These criteria are summarized in the following table:

Sliding scale for IDFG recreational fishing impacts on listed Snake River spring/summer chinook in the Snake River basin (excluding the South Fork Salmon River terminal fishery).

Lower Granite Dam Predicted Return of Naturally Produced Listed Spring Chinook	Proposed Maximum Percent of Naturally produced Run Mortality for IDFG Recreational Fishery	Range of Potential Incidental Mortalities (number of fish)	Estimated Total Take (catch and release)
< 4,000 †	0%	0	-
4,001 to 6,400	0.25%	10 – 16	100 – 160
6,401 to 14,250	0.5%	32 – 71	320 – 710
14,251 to 21,400	0.75%	107 – 161	1,070 – 1,610
21,401 to 28,500	1.0%	214 – 285	2,140 – 2,850
28,501 to 35,600	1.5%	428 – 534	4,280 – 5,340
> 35,601	2.0%	> 712	>7,120

† At these low run sizes, fisheries are restricted to terminal areas.

8. The IDFG and the ODFW may jointly initiate a fishery on the Snake River, where it forms the boundary between the states of Oregon and Idaho. If such a fishery is conducted, it shall be allowed conditional upon ODFW adopting reciprocal regulations. The total incidental take shall be within the terms and conditions of this permit. If Oregon requests, and the IDFG agrees to provide, incidental take coverage pursuant to this permit, the ODFW fishery shall operate in accordance with the terms and conditions of this permit. Joint fisheries in this reach of the Snake River shall be reported by IDFG and by the ODFW to ensure that harvest objectives and joint (or separate) incidental take limits are not exceeded. The

reporting of this take by the IDFG may be included in the required annual report, if clearly identified as such.

9. The IDFG and the WDFW may jointly initiate a fishery on the Snake River, where it forms the boundary between the states of Washington and Idaho. If such a fishery is conducted, it will be allowed conditional on WDFW adopting reciprocal regulations. The total incidental take shall be within the terms and conditions of this permit. If Washington requests, and the IDFG agrees to provide, incidental take coverage pursuant to this permit, the WDFW fishery shall operate in accordance with the terms and conditions of this permit. Joint fisheries in this reach of the Snake River shall be reported by IDFG and by the WDFW to ensure that harvest objectives and joint (or separate) incidental take limits are not exceeded. The reporting of this take by the IDFG may be included in the required annual report, if clearly identified as such.

10. On the South Fork Salmon River, the annual incidental take caps are determined according to NMFS' 2000 biological opinion on Impacts of Treaty Indian and Non-Indian Fisheries in the Snake River basin in Year 2000, on Salmon and Steelhead Listed Under the Endangered Species Act. NMFS shall review the predicted return of unlisted, hatchery-produced, adult salmon as well as the predicted return of ESA-listed hatchery and naturally produced adult salmon, the proposed fishing regulations, and incidental take quotas. The IDFG fishery shall be in compliance with total incidental take limits for that year. In any year when a fishery occurs in the Salmon River that affects fish returning to the South Fork Salmon River, the incidental mortality of ESA listed adults bound for the Poverty Flat Index Area and South Fork Salmon River weir that occurs in the Salmon River fishery shall be subtracted from the forecast return to these areas.

11. No more than 100 threatened, adult, Snake River Basin steelhead may be caught and released, of which 5 might die, in fisheries implemented under Idaho's Anadromous Salmon Fishing Regulations.

12. The IDFG shall submit their spring/summer chinook salmon fishery proposal to NMFS by March 15 of each year a fishery is proposed. NMFS will review the annual spring/summer chinook salmon proposed fisheries identified by IDFG to determine if they are consistent with the permit and sliding scale. If found to be consistent, NMFS will provide a letter to IDFG by April 15 approving the fishery in that year.

Steelhead Fishing Regulations.

The maximum number of listed fish that may be encountered and that may subsequently die during implementation of the Steelhead Fishing Regulations is determined as follows:

13. a. Neither targeting nor retention of adult fall chinook salmon shall be allowed in Idaho's steelhead fishery regulations.
    b. No more than 1.5% of the adult, naturally produced listed Snake River fall chinook salmon counted over Lower Granite Dam, shall be caught and released, of which 10% might die.

14. a. Live release of any steelhead with intact adipose fin shall be required in Idaho's fishery regulations.
    b. No more than 3.2% mortality (resulting from catch and release of up to 64 percent) of naturally produced Snake River Basin steelhead returning to Idaho, incidental to harvest of hatchery-produced steelhead, shall occur.

15. a. NMFS shall require IDFG to submit their spring/summer chinook salmon fishery proposal by March 15 of each year a fishery is proposed.
    b. NMFS shall review the annual spring/summer chinook salmon proposed fisheries identified by IDFG to determine if they are consistent with the permit and sliding scale. If found to be consistent, NMFS shall provide a letter to IDFG by April 15 approving the fishery in that year.

7.0 REINITIATION OF CONSULTATION

Reinitiation of consultation is required if: (1) The amount or extent of take specified in the permit is exceeded, (2) new information reveals effects of the action that may affect ESA-listed species or critical habitat in a manner or to an extent not previously considered, (3) the action is subsequently modified in a manner that causes an effect to ESA-listed species or critical habitat that was not considered in the biological opinions, or (4) a new species is listed or critical habitat is designated that may be affected by the action.

8.0 MAGNUSON-STEVENS ACT ESSENTIAL FISH HABITAT CONSULTATION

8.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NMFS is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

8.2 Identification of Essential Fish Habitat

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon – chinook (*O. tshawytscha*), coho (*O. kisutch*), and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999) – as well as for a number of marine species that do not occur in Idaho. Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC (1999)), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

8.3 Proposed Action and Action Area

For this EFH consultation, the proposed actions and action area are as described in detail in the biological opinion (Section II). The action is the issuance of an incidental take permit pursuant to section 10(a)(1)(B) of the ESA for the continuing implementation and management of fishery harvest regulations by the Idaho Department of Fish and Game (Permit #1481). The proposed action area is the portion of the Snake River basin in Idaho in which anadromous salmonids may occur and is part of the EFH for chinook salmon; the Clearwater River portion of the action area is part of the EFH for coho salmon. Assessment of the impacts on these species' EFH from the above proposed action is based on information provided in the permit application and the biological opinion. While the ESA analysis did not explicitly consider effects on coho salmon, the effects of the proposed action on coho salmon habitat would be no greater than the effects on chinook salmon habitat in location, type, and magnitude.

8.4 Effects of the Proposed Action

As described in detail in Section 5 of the biological opinion, the proposed action is not likely to result in an adverse effect on any habitat parameter. Based on the effects on habitat discussed in the ESA consultation analysis, there may be temporary and localized disturbances of EFH related to fishing, but that effect has not been measured and is believed to be minor.

8.5 Conclusion

NMFS concludes that the proposed action would not adversely affect designated EFH for chinook or coho salmon.

8.6 EFH Conservation Recommendation

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions that may affect EFH.

Because NMFS has determined that the proposed action is not likely to adversely affect EFH for Pacific salmon, NMFS has not identified any EFH conservation recommendations.

8.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NMFS' EFH conservation recommendations within 30 days of receipt of these recommendations.

Because NMFS has determined that the proposed action is not likely to adversely affect EFH for Pacific salmon, no statutory response is required at this time.

8.8 Consultation Renewal

The NMFS must reinitiate EFH consultation if the proposed actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR Section 600.920(k)).

9.0 DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) ("Data Quality Act") specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Biological Opinion addresses these DQA components, documents compliance with the Data Quality Act, and certifies that this Biological Opinion has undergone pre-dissemination review.

9.1 Utility

These ESA section 7 and MSA consultations on the proposed fishery management program determined that the proposed action will not jeopardize the affected ESUs. Therefore, NMFS can issue an incidental take permit. The intended user is the Idaho Department of Fish and Game. The scientific community, resource managers, and the stakeholders benefit from the consultation.

9.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, "Security of Automated Information Resources," Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

9.3 Objectivity

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased, and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA Regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the literature cited section. The analyses in this biological opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data, and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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